JUNE, 1963 • 50¢

AMERICAN
Cinematographer

International Journal of Motion Picture Photography and Production Techniques

Photographing

THE GREAT ESCAPE

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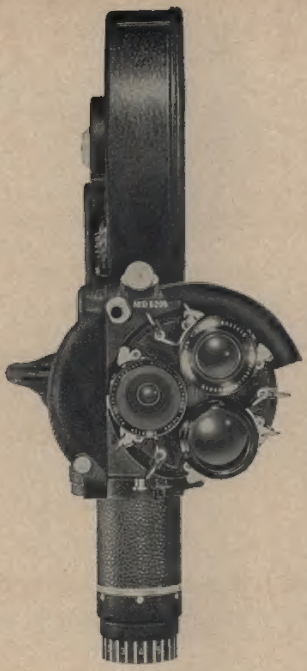

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INTERNATIONAL JOURNAL OF MOTION PICTURE PHOTOGRAPHY AND PRODUCTION TECHNIQUES

JUNE, 1963 Vol. 44, No. 6

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Du Pont SUPERIOR* 2

Bernard Dresner's Choice for Important Assignments

On-location assignments took award-winning cinematographer Bernard M. Dresner more than 62,000 miles in the last 12 months. They carried him around the world and from the Arctic wastes of Greenland to the jungles of Colombia, South America. Here's what he has to say about his constant companion, Du Pont SUPERIOR 2.

"In the Arctic I needed a wide latitude film that would give me continuous telecast quality against the glare of ice and snow. Wide-range SUPERIOR 2 filled this need perfectly—even on tricky close-up shots involving flesh tones against walls of ice.

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Cinematographer Bernard M. Dresner (foreground on location in Greenland using SUPERIOR 2 t film the CBS "The Twentieth Century" program "City Under the Ice."

Some of the recent awards won or shared in by Mr. Dresner are the Grand Prix (travelogue category) at the Cannes Film Festiva the Peabody Award, the Blakeslee Award the Trans World Airlines Writing and Pic ture Award and the Emmy Award.

Dresner used Du Pont motion pictur film for each of his prize-winning effort in black-and-white. SUPERIOR 2 is just on of many Du Pont films—each designed t satisfy your motion picture needs. Film an data on them are available to you. Jus write any of the Du Pont Photo Product Sales Offices listed below.

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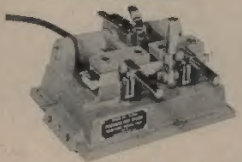

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INDUSTRY NEWS

News briefs of industry activities, products and progress

Arriflex Honors American Representative

The coincidence of Photokina '63 and the Tenth Anniversary of the introduction of the 16mm Arriflex professional motion picture camera in the United States was highlighted by the presentation of a silver trophy to Mr. Paul Klingenstein (right, in photo above), President of Arriflex Corporation of America. Presentation was made in Cologne by Dr. Robert Richter (L) President of Arnold & Richter. Mr. Erich Kaestner, Chief Design Engineer of Arnold & Richter, shares in the happy event.

Acknowledging 10 years of tremendous growth, the trophy is inscribed: "To Arriflex Corporation of America In Recognition Of Outstanding Arriflex Success In The U.S.A. From Arnold & Richter, KG, Munchen, March, 1963."

•

TV Film Production Off To Good Start

With a record 3500 employees on its payroll, Revue Studios last month was busiest studio in Hollywood. "What might develop into a new era of employment in Hollywood," said *The Hollywood Reporter*, "is under way at Revue which during the next four weeks will employ approximately 3500 persons as it swings into peak telefilm production. This is a record for a telefilmery, and tops many feature studios' all-time job marks."

Meanwhile, National Broadcasting Company set up a film unit in Hollywood to produce telefilms. Heading up new unit is Felix Jackson. NBC-produced films will augment filmed shows from other suppliers, the company reports, and added it is building its own film organization for more NBC-produced shows in Hollywood.

Hollywood Feature Film Production Rising

Production of feature films by the Hollywood studios took another upward jump last month; there were 30 films before the cameras May 10 as compared to 28 the previous week, and 25 the week before. Of the 30 features, 19 were shooting in Hollywood—the rest out of the state or on location overseas.

•

New Equipment Purchases Seen For Proposed Super Film Center

In the event Columbia Pictures, MGM and 20th Century-Fox undertake the plan presently under consideration to jointly erect a vast new modern film studio in Malibu, California, it will be equipped with all new camera, lighting and sound recording equipment, it is reported, giving the production companies working there the finest film making set-up to be found anywhere.

A primary consideration in building a completely modern production center, spokesmen for the studios said, is to enable Hollywood more effectively to compete in today's world market. "There is now greater opportunity for profitable growth than at any time in film history," they pointed out.

•

B. G. Tubbs Elected President Of Mitchell Camera Corp.

B. G. Tubbs, who joined Mitchell Camera Corp. of Glendale, Calif. in 1961 as Vice-president and General Manager, last month was elected to the company presidency.

The company also announced the promotion of Paul Piper, formerly Financial Control Manager for the company to Assistant Treasurer.

In addition to manufacturing the famous Mitchell NC and BNC 35mm motion picture cameras, the standard in most motion picture studios for years, the company also is active in special camera design and production for CBS, U.S. Army, Air Force, and the Navy.

•

Gevaert Company Expands

The Gevaert Company of America, Inc., has opened a new branch office near Detroit to serve film makers in the Great Lakes area. Located at 27236 Southfield Road, Lathrup Village,

Continued on Page 320

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What's Inside?

Precise information on costs of processing 35mm and 16mm color and black-and-white motion picture film and slide films, including developing, dailies, trial prints, release prints, dupes, internegatives, interpositives, A & B and additional roll printing, coding, etc., etc.

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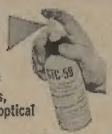

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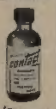

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INDUSTRY NEWS

Continued from Page 318

Michigan, it is headed by Fred Schaetzing, formerly company sales manager, Chicago district. New office brings to eight the number of Gevaert branch offices and warehouses located throughout the United States.

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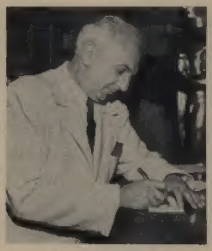

HAL MOHR, ASC

Hal Mohr, William Daniels On Academy Board For 1963-64

Hal Mohr, ASC, representing the Cinematographers Branch, was re-elected last month for a two-year term to the 1963-64 Board of Governors of the Academy of Motion Picture Arts and Sciences, Hollywood. William H. Daniels, ASC, who was elected to the Board last year, also represents the Cinematographers Branch of the Academy. Wendell Corey is Academy President.

•

Behrend's, Inc., Opens Office In Cleveland

Behrend's, Inc., Chicago, last month opened its Cleveland, Ohio, office at 4019 Prospect where it will specialize in the sale and rental of motion picture equipment, including cameras, lights and editing equipment. Heading the office is Mac Blair.

•

SPIE Sets Symposium Date

The Society of Photographic Instrumentation Engineers will hold its 8th Annual Technical Symposium at the Los Angeles Ambassador Hotel, August 5 through 9, 1963.

The five-day meeting will offer technical papers, seminars and workshop sessions covering the advanced techniques of photo-optical data acquisition, storage, retrieval and assessment and relate this science of precise measurement to the demands of the aerospace age. An extensive exhibit of instruments and materials will be on display.

India To Start Raw Film Manufacture

The state-owned raw film plant at Ooty, in India, is expected to go into production sometime early in 1964, according to report in *Journal of the Film Industry*, motion picture trade paper published in Bombay.

•

SMPTE Mulling Expansion

Three national photographic engineering societies are proceeding with merger plans following preliminary approval by their governing bodies. They are:

Society of Motion Picture and Television Engineers (SMPTE), the Society of Photographic Scientists and Engineers (SPSE), and the Society of Photographic Instrumentation Engineers (SPIE). Heading the liaison committees have been Ethan M. Stifle of Eastman Kodak Co., who is executive vice-president of SMPTE; George Eaton of Eastman, representing SPSE, and A. J. Carr, executive secretary of SPIE.

If the consitution and plans are approved by the boards of the three societies, they will be submitted to a referendum of the individual members.

•

Video Film Labs Moves

Video Film Laboratories, specialists in 16mm film developing and printing, has moved to new and larger quarters at 311 West 43rd Street, New York City.

•

Victor Duncan Now In Dallas

Victor Duncan Company, Detroit, has established a branch office at 9009 Freeport Drive, Dallas, Texas. The company, which has long been established in renting professional motion picture cameras and accessories, will now offer Mitchell, Arriflex and other cameras to film makers from both its Detroit and Dallas offices. Henry Kokojan heads the Dallas branch.

•

Byron Haskin To Head Daystar Special Effects

Byron Haskin, veteran cinematographer and director who for eight years was head of special effects for Warner Brothers, has been signed by Daystar Productions, Hollywood., to create and supervise special effects for the company's new science-fiction TV film series "The Outer Limits," now in production at KTTV and MGM studios.

•

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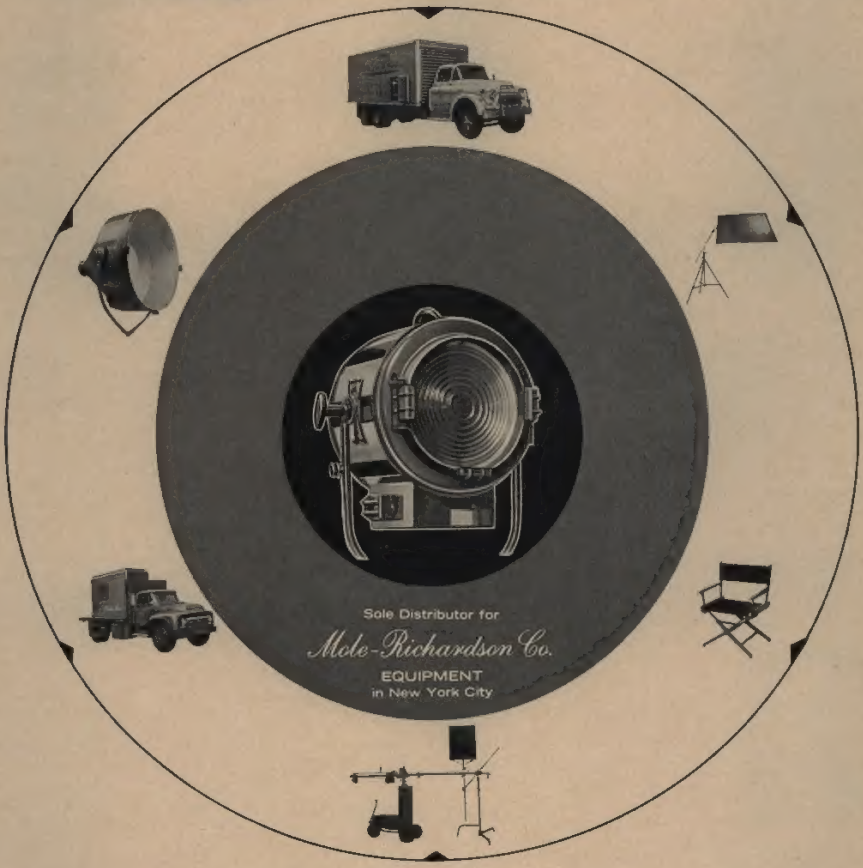

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News briefs about the A.S.C., its members, and important industry personalities

HARRY STRADLING, ASC

Stradling To Film "Fair Lady"

Warner Brothers has signed Harry Stradling, ASC, to direct the photography of "My Fair Lady," which goes before the cameras at the Burbank studio August 1st. The production, which stars Audrey Hepburn and Rex Harrison, will be photographed in Super-Panavision 65 and color. Director is George Cukor. Stradling recently completed the color photography of "Mary, Mary," a Mervyn LeRoy production for Warner Brothers.

Fredericks Filming "7 Days"

Ellsworth Fredricks, ASC, is directing the photography of "Seven Days In May" at Paramount studios in Hollywood. The Seven Arts-Frankenheimer-Joel Production, which began shooting May 17, stars Burt Lancaster, Kirk Douglas, Fredric March, and Edmond O'Brien. Upon completion of studio shooting, the company is scheduled to do location filming in Washington, D. C.

ELLSWORTH FREDRICKS ASC

Mohr Filming Documentary

ASC-prexy Hal Mohr is directing the color photography of a 90-minute commercial documentary film for the makers of Listerine. Film, which will trace the origin of the Listerine formula and stress the germicidal values of the product which have made it a household word for decades, will involve extensive location photography.

GEORGE FOLSEY, ASC

Cinematographer Folsey Cited For Best Color TV Commercial

George Folsey, ASC, last month was honored with a special citation of the American TV Commercials Festival which held presentation ceremonies at the Waldorf-Astoria Hotel in New York, May 24th. The citation was for Best Color Cinematography of a TV Commercial and was sponsored by Radio Corporation of America.

The specific commercial for which Folsey won the citation was for Ford Thunderbird, titled "How Would You Like," produced by Group Productions for the J. Walter Thompson Co. advertising agency.

Citation for Best Black-And-White Cinematography of a TV Commercial went to Leonard Hirschfield for the Sprite Soft Drink commercial "Spice," produced by VPI Productions. Award was sponsored by Eastman Kodak Co.

Laszlo Shooting "4 For Texas"

"Four For Texas," which went before the cameras at Warner Brothers Studio May 24th, is being photographed in color for Technicolor release by Ernest Laszlo, ASC. Heading the cast is Frank Sinatra, Dean Martin, Anita Ekberg, Bette Davis, Victor Buono and Charles Bronson. Producer-director is Robert Aldrich.

ERNEST LASZLO ASC

Daniels Filming "The Prize"

MGM's Panavision-Metrocolor production, "The Prize," starring Paul Newman, Edward G. Robinson, Elke Sommer and Diane Baker, went before the cameras in Culver City May 13th. Directing the photography is William Daniels, ASC.

WILLIAM DANIELS ASC

Daniels, incidentally the "most recent" past-president of the ASC, was guest of honor at the Society's May dinner-meeting, at which time he was presented with a plaque commemorating his services and contributions to the ASC during his two-term presidency.

Bob Tobey Filming "Hawaii Calls" Pilot

Bob Tobey, ASC, who photographed many of the "Hawaiian Eye" TV films for Warner Brothers, left for Honolulu June 1st where he will direct the photography of the pilot film for the proposed "Hawaii Calls" TV series. Pilot will be made in 16mm color and will feature Webley Edwards, original M.C. for the "Hawaii Calls" radio program.

Incidentally, Tobey and fellow cinematographer Jack Russell, ASC, have been exchanging birthday cards for the past 33 years—the same card! Both being Scotch, the idea is understandable. Over the years, each has saved also the envelopes in which the card is received and all accumulated envelopes, together with the original card with some new message appended, have been remailed—or as the accumulation grew—have been shipped by messenger or express.

Last year Bob Tobey shipped the lot to Russell in an old steamer trunk, which was deposited in front of his garage the evening of his birthday, May 15th. Now Tobey, whose birthday is in October, awaits Russell's move to top him. Meanwhile, Tobey gave new impetus to the gag when he prevailed upon Russell's brother ASC members to send him birthday cards this year—duplicates of the original card, which Tobey had copied and supplied to them. ■

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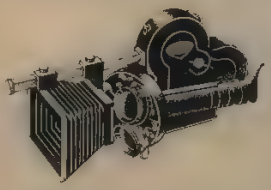

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WHAT'S NEW

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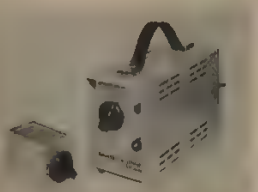

COLORDYNE DIMMER

The ColorDyne-1000 is compact dimmer for use with incandescent or quartz-iodine lamps in any combination up to maximum of 1000-watts. Permits use of 3350°K and 3450°K Q I lamps at 3200°K without filters, extending life of lamps to about 100 hours; is said to extend life of incandescent lamps 50 per cent. Control range is from zero to full intensity through a single adjustment knob. Provision for remote control unit. ColorTran Industries, 630 So. Flower St., Burbank, Calif.

INSTANT FILTER MAKER

Mitchell 35mm filter punch cuts exact size gelatin filter squares quickly and accurately. Pressing down upper plate of device cuts filters from gelatin stock which fit any 35mm Mitchell camera filter holder. Six filters can be cut from one 3-inch square of gelatine material. Mitchell Camera Corp., 666 West Harvard St., Glendale, Calif.

ARRI LENS ADAPTER

New Cin-Ar lens adapter doubles the value of Arriflex lenses by permitting them to be used also on "C" mount cameras. Construction is rich looking, black anodized aluminum, precision turned and internally flocked to prevent light reflection. List price is $16.50. Designed and manufactured by Burns & Sawyer Cine Equipment Co., 6124 Santa Monica Blvd., Hollywood 38, Calif.

NEW PROFESSIONAL SUN GUN

Newest Sun Gun photo light (model SG 63A) weighs but 3½ lbs. and can be held in one hand. It is equipped with a 1000-watt high-silica halogen lamp in non-tarnishing reflector, and produces 65,000 center-beam candlepower with a color temperature of 3400°K at 120 volts. Head is adjustable through a tilt range of 90°. Features include locking, rotatable two-leaf barndoors, head-angle positioning arm and lock, channel that accommodates flood or portrait lenses, and 12 ft. cord. Sylvania Electric Products, Inc., New York 17, N. Y.

POWER CONVERTER

Available for sale or rental from Camera Service Center, Inc., 333 West 52nd St., New York 19, N. Y., is new CSC Rotor Converter location power pak for converting 24-v power to 115-v 60 cycle A.C. The ruggedly-built unit

Continued on Page 326

*BOON 1. A welcome benefit; blessing.
— Webster

The Lipsner-Smith ultra-sonic film cleaning machine was first introduced to the Hollywood motion picture industry by Consolidated Film Industries.

Thru close user-manufacturer collaboration and under actual working conditions, CFI technicians helped develop the original machine to today's practical** and efficient machine. Now, ultra-sonic cleaning has become standard procedure for negative cleaning in film processing laboratories throughout the world.

A famous first from CFI One of many in its 40 + years of serving the film industry.

***STILL ANOTHER FIRST FROM CFI is the recent development of a solvent recovery system that further extends the use of ultra sonic cleaning.*

CFI

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The lightest (5 lb. 10 oz.), smallest (2½"x5"x10") truly professional (broadcast-quality) portable instrument of its kind in existence, it is Swiss-precision engineered, still plenty rugged on location where it has to be. And it carries its own power with it (new Dryfit rechargeable storage cells).

Other Features include:

- MANUAL AND FULLY AUTOMATIC VOLUME CONTROL
- SYNCHRONIZATION with 16 and 35 mm cameras
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Plus Accessories

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HOLLYWOOD, CALIFORNIA 6510 Santa Monica Blvd. • HO 9-8322

WHAT'S NEW

Continued from Page 324

is completely enclosed and specially mounted for silent and vibrationless operation. The 750-watt output is sufficient to operate two Mitchell cameras, tape recorder and all accessories continuously for two hours or for eight hours of intermittent shooting.

MINI-MONITOR

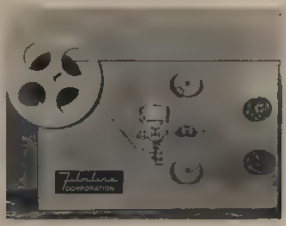
Florman & Babb, Inc., 68 West 45th Street, New York 36, N. Y., announces the Mini-Monitor, first miniature, transistorized, battery-powered, magnetic sound reader complete with amplifier and speaker. Weighing less than 8 oz., Mini-Monitor is about same length and width as a pack of cigarettes 5"x3"x2".

The Mini-Monitor has multiple uses: for field and location checking and play-back of magnetic tape; it can be attached to a Moviola, editing table synchronizer, recorder or sound projector or wherever magnetic tape is used.

Auxiliary uses are, as a portable public address system, a projection booth speaker, playback monitor for tape recorders, phono amplifier, remote speaker systems, and 8mm magnetic sound reader. The Mini-Monitor has both low and high impedance input and will drive an auxiliary speaker up to 8" in size. Price complete is $49.50.

1-TO-10 ZOOM LENS

Designated the Zoom 10X25, this new Angenieux 35mm, f 3.2 zoom lens is said to compare closely with standard optics over the entire range of focal lengths from 1" to 10". Lens is 10½" long and has maximum diameter of 4½". Its long back focal length of 2.35" makes lens adaptable to all 35mm motion picture and instrumentation cameras. Zoomar International, Inc., Glen Cove, L.I., New York.



FILM SLITTER

Designed for high-production, high-accuracy slitting of 8mm motion picture film. Dual-takeup feature permits simultaneous slitting and rewinding. Slitting wheels can be resharpened indefinitely without altering the dimensional characteristics of film after slitting. Model SL-100 complete and ready to operate, $2,500. F.O.B. Milford, Conn. Manufacturer is Filmline Corporation.

CINE-VOICE CONVERSION

S.O.S. Photo Cine Optics, Inc. announces a balanced Cine-Voice conversion and an improved Transist-O-Sound amplifier with an exclusive built-in limiter.

The S.O.S. conversion consists of cutting down the Auricon Cine-Voice camera to the lowest practical point and mounting a machined and anodized plate assembly to accept standard Mitchell 400-ft. or 1200-ft. magazines. Installation includes an external, silent torque take-up motor to handle loads from 400 to 1200 feet, and includes a footage counter. Cost of the conversion is $195.00.

The new Transist-O-Sound amplifier for use with converted camera weighs 2¾ lbs. with the added exclusive feature of a built in limiter. The new Model 2CSA L offers two low microphone input impedances of 35 or 250 ohms, permitting high quality broadcast type mikes to be used at front under the lens. Separate gain controls for each channel makes possible 20% more microphone gain per channel. Frequency response is flat within 1 db from 15,000 cps, equalized for the Auricon galvanometer.

The new Transist-O-Sound is available either as a permanently attached unit with no wires or as a separate unit which can be quickly attached through tripod stud holes. ■

Look What's Happened to the SUN GUN® Photo Light!

Now it's all head (no handle)—easier to mount with a new universal post clamp.

Now it comes complete with a new transistorized SYLVAC(TM) Control that lets you dial the color temperature you need for each shot.

And it's a complete, portable, studio lighting system priced lower than you would ever imagine.

The new 3½-lb. SUN GUN Photo Light is equipped with dual leaf rotating and locking barn doors that turn a full 360°. And there's a full range of standard and optional accessories that lets you do virtually anything with the light from its powerful 1000-watt lamp

The new SYLVAC Control tells you the exact voltage across the lamp, allows you to dial the precise color temperature you require—gives you quick, easy, fingertip control of light intensity and lighting ratios for black-and-white work, too. It comes in two models: SV-9 for controlling one SUN GUN photo light, SV-20 for controlling two.

Details? Ask your dealer—or write Sylvania SUN GUN Products, Sylvania Electric Products Inc., 730 Third Ave., New York 17, N. Y.

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BEHIND THE CAMERAS

WHAT THE INDUSTRY'S CAMERAMEN WERE SHOOTING LAST MONTH

BY MARION [illegible]HINS

NOTE: Asterisks following titles indicate television film productions.

AMERICAN-INTERNATIONAL

MARIO BAVA, "Black Sabbath" (Galatea Prods., AIP, Eastman color) with Boris Karloff and Mark Damon. Mario Bava, director.

MANUEL BERENGUER, ASC, "A Cold Wind from Hell" (SWP Prod.; Pancop, shooting in Spain) with Barry Sullivan and Martha Hyer. Sidney W. Pink, director

FLOYD CROSBY, ASC, "The Haunted Palace" (Color) with Vincent Price and Debra Paget. Roger Corman, producer-director.

KAY NORTON, "Beach Party" (Nicholson-Arkoff Prod., Pathe Color) with Bob Cummings and Dorothy Malone. William Asher, director.

BILTMORE STUDIOS, N.Y.

ANDREW LAZZO, "Naked City"*.

BIOGRAPH STUDIOS—New York

JOHN S. PRIESTLY, "East Side, West Side"*.

CASCADE STUDIOS

ELWOOD BRADLEY, ASC, Commercials*.

TYLER BYARS, Commercials*.

HAL MOHR, ASC, Commercials*.

CBS—N.Y.

CHARLES MACK, LEO ROSSI, ROBERT CLEMENTS, "CBS Reports"*.

FRED HOFFMAN, MIKE ZINGALE, "Candid Camera"*.

COLUMBIA STUDIOS

GIL TAYLOR, "Doctor Strangelove: Or How I Learned to Stop Worrying and Love the Bomb" (Trooper Films; shooting in Europe) with Peter Sellers and George C. Scott. Stanley Kubrick, producer-director.

LEON SHAMROY, ASC, "The Cardinal" (Gamma Prod., T'color with Tom Tryon and Romy Schneider. Otto Preminger, producer director

JOSEPH BIROC, ASC, "Under the Yum Yum Tree" (Brisson-Swift Prods., Eastman color) with Jack Lemmon and Carol Lynley. David Swift, director.

CHRISTOPHER CHALLIS, "The Long Ships" (Warwick Films Prods., Technirama-Technicolor, shooting in Yugoslavia) with Richard Widmark and Sidney Poitier. Jack Cardiff, director.

GERALD HIRSCHFIELD ASC, "Fail Safe" (Youngstein Lumet Prod., Shooting in N.Y.) with Henry Fonda and Dan O'Herlihy. Sidney Lumet, producer-director

GERT ANDERSEN, ASC, "Donna Reed Show"*.

ROBERT BRONNER, ASC, Commercials*.

EUGENE SHUFTAN, "Lilith" (Centaur Prods.; locations in N.Y. & Md.) Robert Rossen, director.

JACK MARTA, "Route 66"*.

BURNETT GUFFEY, ASC, Commercials"*.

FRED GATELY, ASC, "Hazel"*

WILKIE POLLARD, "Siege of the Saxons" (Chas. H. Schneer Prods., T'color, shooting in London) with Janette Scott and Ronald Lewis. Nathan Juran, director

IRVING LIPPMAN, "The Three Stooges Go Around the World in a Daze" (Normandy Prods.) with the Three Stooges. Norman Maurer, producer director.

DESILU—Gower

TED VOIGHTLANDER, ASC, "Ben Casey"*.

MAURY GERTSMAN, ASC, "The Lucy Show"*.

ROBERT PLANCK, ASC, "My Three Sons"*.

FILMWAY STUDIOS—New York

MORRIS HARTZBAND, ASC, "The Defenders"*.

GENERAL SERVICE STUDIOS

ROBERT MORENO, "Adventures of Ozzie & Harriet"*.

INDEPENDENT

LOYAL GRIGGS, ASC, "The Greatest Story Ever Told" (Geo. Stevens Prod. UA release: P'Vision & Cinerama in Technicolor with Max Von Sydow and Charlton Heston George Stevens, producer-director

CONRAD HALL, "Stoney Burke"* (Daystar).

JOE MACDONALD, ASC, "Kings of the Sun" (Mirisch Prod.; UA release; P'Vision & DeLuxe color; shooting in Mexico) with Yul Brynner and George Chakiris. J. Lee Thompson, director.

ROBERT KRASKER, "The Fall of the Roman Empire" (Samuel Bronston Prod., Ultra P'Vision & Technicolor; shooting in Spain) with Sophia Loren and Stephen Boyd. Anthony Mann, director.

TED MOORE, "From Russia, With Love" (Eon Prods., shooting in London) with Sean Connery and Pedro Armendariz. Terence Young, director

LINWOOD DUNN, ASC, "The Long Corridor" (Leon Fromkess Prod.) Special Effects.

LINWOOD DUNN, ASC, JAMES GORDON, ASC, "It's A Mad, Mad, Mad, Mad, World" (Stanley Kramer U.A.) Special Effects.

WILLIAM GARRONNI, "John Glenn in Japan" (MASA, shooting in Japan; color) Robert Yung, director

RICHARD WINER, "Sport Shorts."

WILLIAM STORZ ASC, "On the Art of Ballet" (Film Productions, shooting in N.J.).

ENZO SERAFIN, "Wounds of Hunger" (Color; Widescreen; Shooting in Spain) with Russano Brazzi and Mark Damon. Saul Swimmer, director

LA BREA STUDIOS

ROBERT HAGER, "Perry Mason"*.

M-G-M STUDIOS

CHARLES LANG, ASC, "The Wheeler Dealers" (Filmways Prod.; P'Vision & Metrocolor) with Lee Remick and James Garner. Arthur Hiller, director.

DALE DEVERMAN, ASC, "The Eleventh Hour"*.

GEORGE CLEMENS, ASC, ROBERT PITTACK, ASC, "Twilight Zone"*

WILLIAM SPENCER, ASC, "The Richard Boone Show"*

Continued on Page 332

5,000 watts from "pocket size" underwater light

New SeAQUArtz*

Most Powerful Underwater Light

A new concept in underwater lighting is the "pocket size" SeAQUArtz Light, researched and engineered by Birns & Sawyer. The SeAQUArtz is only 7½ inches square but delivers a powerful 5,000 watts of exposure

A Birns & Sawyer designed cast aluminum housing with convection cooling fins, accommodates the intense, 65,000 candlepower, quartz iodide Sylvania Professional Sun Gun lamp and reflector. The exclusive reflector design has over 750 light intensifying surfaces individually engineered to work with and reinforce one another to provide a brilliant, evenly distributed, easily directed light.

The compactness and light weight of the SeAQUArtz makes possible new freedom, flexibility and maneuverability in underwater photography and illumination. It comes with adjustable locking yoke which attaches to camera or underwater apparatus for angling the beam. Unit can also be attached with C clamps. SeAQUArtz lights are available for 115 volt AC, 220 volt AC or 30 volt DC battery pack. Waterproof Joy connector cable comes in 50 and 100 ft. lengths, can be joined to reach greater depths.

The SeAQUArtz with its special ½-inch thick Pyrex lens, can withstand pressure to 300 feet. Other SeAQUArtz lights are in development with 1,000 ft. depth capabilities.

Typical applications are for marine life study, geology, A.S.W research, dredging and salvage operations, boat hull examinations, underwater missile research, piling and pier construction, harbor building and repair.

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Shown above: Catalog 5500 — SeAQUArtz light for 115 volt A.C. . . . $275.00

For prices on other models, cables and accessories, request SeAQUArtz Data Sheet.

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ARRIFLEX at work — ONE OF A SERIES*

NBC NEWS CORRESPONDENT MARTIN AGRONSKY (FAR LEFT) INTERVIEWS CAPT. EDWARD COOKE ABOARD U.S.S. GEORGE WASHINGTON WHILE ARRIFLEX RECORDS THE EVENT.

DOWN UNDER, WHERE ELBOW SPACE IS A LUXURY, THE COMPACT ARRIFLEX FILMS MISSILE-FIRING ACTIVITY

ARRIFLEX® goes underseas in pioneer recording of POLARIS missile launching

Filming of a realistic exercise aboard Polaris submarine **U.S.S. George Washington**, was climaxed by the actual launching of its missiles into the Atlantic Missile Range. News Correspondent Martin Agronsky, Associate Producer Daniel Karasik and a crew of four created an hour-long documentary color film, "Polaris Submarine: Journal of an Undersea Voyage," shown over NBC-TV Network. Director Tom Priestly and Cameraman Scott Berner selected the compact, easily maneuverable Arriflex 16 for the pioneering job. The NBC newsmen, first TV team ever permitted aboard during a mission, met the Polaris sub at sea. Once submerged, the **George Washington** was under "battle" orders not to resurface — **for any reason** — for 16 days. Working day and night, approximately 14 hours a day, the camera crew filmed duty tours, church services, recreation activities and "bull" sessions of officers and men, then settled down to the serious business of missile-firing activity — recording the underwater launching after the warheads had been removed. Meeting all challenges on land, in the air, on the sea — or **under** it — Arriflex does its usual dependable job rapidly, accurately and economically. It will do the same for you.

From the microscope to the missile range... from spot locations to sound stages... Arriflex professional motion picture cameras are the dominant choice of filmmakers in science, industry, and entertainment. They're lightweight, rugged, tremendously versatile — uniquely suited to a range of applications virtually without limits. Here are some of the features that give Arriflex cameras their remarkable capabilities:

• MIRROR-SHUTTER REFLEX VIEWFINDER • REGISTRATION-PIN FILM MOVEMENT • 21°-DIVERGENCE 3-LENS TURRET • CONTOUR HAND GRIP • FRAMES-PER-SECOND TACHOMETER • COMPLETE ACCESSORY SYSTEM... lenses, standard and special-purpose electric drives, power supplies, time-lapse equipment, film magazines, sound blimps, tripods.

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BEHIND THE CAMERAS

Continued from Page 328

LEO TOVER, ASC, "Sunday in New York" (Widescreen-Metrocolor; shooting in N.Y.) with Cliff Robertson and Jane Fonda. Peter Tewksbury, director

PHILIP LATHROP ASC "Twilight of Honor" (P'Vision) with Richard Chamberlain and Nick Adams. Boris Segal, director.

PARAMOUNT STUDIOS

MILTON KRASNER, ASC, "Love with the Proper Stranger" (Pakula-Mulligan Prod.; shooting in N.Y.) with Natalie Wood and Steve McQueen. Robert Mulligan, director

WALLACE KELLEY ASC, "Who's Minding the Store?" (York Jerry Lewis Prod.; T'color) with Jerry Lewis and Jill St John Frank Tashlin, director

PARAMOUNT SUNSET STUDIOS

FRANK PHILLIPS, ASC, "Gunsmoke"*

PATHE STUDIOS, N.Y.

GAYNE RESCHER, ASC, "The Nurses"*.

PRODUCTION CENTER, N.Y.

ARTHUR ORNITZ, "Act 1" (Dore Schary Prod., Warner Bros.) with George Hamilton and Jason Robards, Jr. Dore Schary, director

GEORGE STOETZEL, ASC, "The Patty Duke Show"*.

TWENTIETH CENTURY - FOX

DANIEL FAPP, ASC, "Move Over, Darling" (CScope & Color) with Doris Day and James Garner. Michael Gordon, director

LOYAL GRIGGS, ASC

Now directing the photography of "The Greatest Story Ever Told," George Stevens production for United Artists. Griggs replaced William Mellor, ASC, following untimely death of latter in April.

LUCIEN BALLARD, ASC., "Take Her, She's Mine" (CScope-DeLuxe color) with James Stewart and Sandra Dee. Henry Koster, producer-director.

UNIVERSAL CITY

ARTHUR IBBETSON, "The Chalk Garden" (Ross Hunter-Quota Rentals Ltd. Prod., T'color; shooting in England) with Deborah Kerr and Hayley Mills. Ronald Neame, director.

JOSEPH LASHELLE, ASC, "Monsieur Cognac" with Tony Curtis and Christine Kaufman Michael Anderson director

GABOR POGANY, "Dark Purpose" (Brazzi-Barclay Hayutin Prod., Eastman color; shooting in Rome) with Shirley Jones and Rossano Brazzi. Steve Barclay, director.

ELLIS THACKERY, ASC, "Wagon Train"*.

JACK MACKENZIE, ASC, "Leave It to Beaver"*.

RUSSELL METTY, ASC, "Captain Newman, M.D." with Gregory Peck and Tony Curtis. David Miller, director.

LIONEL LINDON, ASC, "Alfred Hitchcock Presents".

BENJAMIN KLINE, ASC, LIONEL LINDON, ASC, "Kraft Mystery Theatre"*.

JOHN RUSSELL, ASC., JOHN WARREN, ASC, "McHale's Navy"*

NICK MUSURACA, ASC, "Jack Benny Show"*.

CLIFFORD STINE ASC., "King of the Mountain" (Eastman color) with Marlon Brando and David Niven. Ralph Levy, director

WALT DISNEY

EDWARD COLMAN, ASC, "Mary Poppins" (T'Color with Julie Andrew and Dick Van Dyke. Robert Stevenson, director.

WARNER BROS.

HAROLD LIPSTEIN, ASC, "Palm Springs Weekend" (Technicolor) with Troy Donahue and Connie Stevens. Norman Taurog, director.

CHARLES LAWTON, ASC, "Youngblood Hawke" with James Franciscus and Suzanne Pleshette. Delmer Daves, producer-director

BURT GLENNON, "77 Sunset Strip"*. "Trac"*

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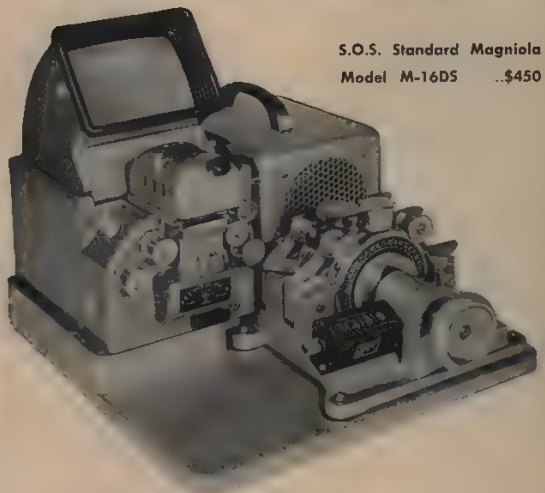

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NOW you can run originals as well as prints with complete confidence in the S.O.S. ACTION VIEWER. Its roller-smooth action is positive insurance against film scratching, or damage to film sprocket-holes. Designed to view films easily . . . for editors, laboratory workers, animators and TV technicians.

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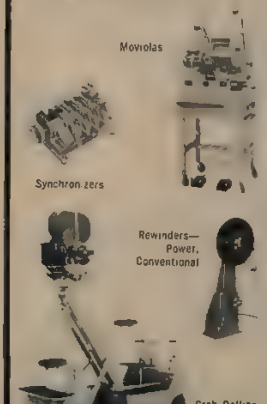

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Q & A

Technical Questions and Answers

Q.—*When negative film is used in the production of single-system optical sound films for television, and the image is changed electronically to positive in the course of TV transmission, fast films such as Tri-X or DuPont 928 are utilized, and a variable density galvanometer used in the camera. What effect does the grain pattern of these fast films have on the sound reproduction? And what would happen to the sound track if it became necessary to over-develop the film to gain a suitably dense picture negative?* J.A.S.

A.—Apparently it is your intention to play the single-system negative on the TV film reproducer. The track must then be considered as a "direct positive" recording and, to avoid serious distortion, must be exposed very low with a resulting unbiased density of approximately 0.4. The noise reduction operation must be reversed—that is, greatest exposure while there is low sound level.

To answer your specific questions: 1) The grain pattern from negative type stock is very detrimental to sound, resulting in a pronounced "hiss" during low-level sound passages. 2) Over-developing the single-system recording raises the gamma (contrast) on picture and sound together. However, in the case of "direct-positive" recording, the higher gamma is beneficial rather than detrimental. This is true for both variable area and variable density types of recording.

Q.—*In order to provide fill light for a large area outdoors, I understand that several sunlight reflectors are often used together. I have observed that most cinematographers achieve very evenly lighted scenes with reflectors, even to the extent of controlling the sun-to-fill ratio (3:1). It would seem impossible from a time standpoint alone to individually place the various reflectors and measure the light. How is this uniformity achieved and the correct ratio maintained without unduly delaying production?*—V.S.

A.—The placement of sunlight reflectors is always controlled by the position of the sun in conjunction with the angle of the shot that is being made. Large areas are "filled" by using a number of reflectors—sometimes a dozen are used. But with enough grips on hand to constantly change the position of the reflectors, the desired result is accomplished.

Cinematographers never measure the light from reflectors to determine a light value ratio. This is accomplished through experience and judgment — judging the balance by sight. Also, a great many shots are "filled" with booster lights, instead of with reflected light, especially closeups and medium shots.

Q.—*I am planning to make a picture with Ektachrome commercial film, using a Cine Special camera with Ektar lenses and also an Arriflex 16 with Schneider lenses. Test footage shot with both cameras show scenes made with the Schneider lenses are considerably "bluer" than those made with the Ektars. Can such differences be corrected in the printing?* E.P.

A.—It is suggested that the lenses be corrected so their respective results will match. If this is not possible, use of compensating filters on the lenses is suggested.

Keep in mind that most film laboratories offer scene-to-scene correction in color film printing.

Q.—*When using ordinary 150-watt lamps with Colortran equipment and setting the converter to 3400° K, must I use a filter with daylight-type Kodachrome film? If I use Type A Kodachrome, should I set the converter to 3200° K?*—A.L.L.

A.—It is necessary to use a Kodak Wratten 80B filter over the camera lens when exposing daylight Kodachrome to 3400° K illuminant. This film-filter combination is suggested for emergency use only, since it is inefficient in use of available exposure illumination. It is recommended that Type A Kodachrome be exposed with 3400° K illumination without a filter. For 3200° K illumination, a Kodak light-balancing filter No. 82A is required for this film.

Identical twins?

(not quite)

One is the Bolex H-8 Rex. One is the Bolex H-16 Rex-2. Both are cameras of highest professional quality. Which one is best for you? The Bolex H-8 Rex gives you the cost-saving advantages of 8mm at a professional level of quality! With superb macro-Switar lenses, variable shutter, reflex viewing and other special effects features, it is an excellent camera for industrial, educational, medical, time lapse, sports coverage, traffic studies, weddings, etc. And you get 100′ double 8 capacity for far longer continuous shooting and film economy! Where highest quality results are a must, the Bolex H-16 Rex-2 is the answer. Lightweight, extremely rugged and dependable, this camera gives top results even under severe climatic conditions. Excellent lens combinations and built-in features give full scope to your ability, for finest television, documentary, industrial, research, training and advertising photography. See both the Bolex H-8 Rex and the Bolex H-16 Rex-2 with companion projectors and accessories at your Bolex dealer's. Why not today?

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- ☐ 16mm camera and accessory catalog
- ☐ 8mm camera and accessory folder

Also, please send me these special technical brochures:

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- ☐ Professional Applications of 8mm Cameras

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DRAMATIC SCENE in The Great Escape in which a harried prisoner of war attempts to escape compound by climbing high barbed wire fence, only to be shot down by German guard (right foreground) being restrained by Steve McQueen, a fellow prisoner.

FILMING 'THE GREAT ESCAPE'

The challenging factor in the successful photography of this picture was the adverse weather conditions in which much of it was shot. The results prove again that color film, in the hands of a skilled photographer, not only can enhance a factual picture but also make excellent detail obtainable when poor lighting is unexpectedly encountered.

By ARTHUR GAVIN

WHILE TECHNICIANS prepare set-up for upcoming scene on prison compound location in Germany, Director of Photography Dan Fapp, ASC, rests behind the Mitchell camera. In foreground, looking over the activities is Producer Director John Sturges.

LOOKING DOWN ON the German prison camp set between takes. The huge Chapman boom (shipped from Hollywood) with camera platform lowered, may be seen in center of picture. Prominent also are several M-R Brutes which furnished booster illumination for the extensive scenes photographed here.

DAN FAPP (sitting behind camera, wearing cap and glasses) discusses upcoming shot with operator James Knott while Director Sturges, right, watches preparation of scene for the camera. Day was one of few when sun shone brightly.

ON A CLOUDY DAY over Tunisia in March, 1943, a burst of fire from a Messerschmitt 109 shattered the tail of the Spitfire flown by Paul Brickhill, wrecking the controls. Brickhill parachuted to the ground in the middle of a mine field, was captured by the Germans and transferred to Stalag Luft III, a prison camp in Germany. There he joined organization "X" on the project he would one day write about as "The Great Escape."

"The Great Escape" is the story of a great adventure—an impossible scheme that was conceived and carried out by an indomitable group of Allied prisoners of war who refused to stay captured and insisted upon causing confusion among the enemy even after all their weapons—except for their ingenuity, imagination and sense of humor—had been taken away from them. The event is considered the largest and most effective mass breakout of POW's in military history.

John Sturges, who produced and directed "The Great Escape" for The Mirisch Company first read the story several years ago and subsequently arranged for its acquisition. To photograph it, the Mirisch Company engaged Daniel Fapp, ASC, who previously had photographed two pictures for them: "One, Two, Three," and "West Side Story."

The picture was shot entirely on authentic locations in Europe. A fictional complete camp resembling Stalag Luft III was built near Munich, and all compound exteriors were filmed there. Exteriors for the escape sequences were shot in the Rhine Country and areas leading toward the North Sea. All interiors were filmed at the Bavaria Studio, near Munich.

Asked why he was shooting the picture in Germany, John Sturges said, "Because this is where the story happened. I wouldn't shoot a western in Spain —I shot 'Magnificent Seven' in Mexico because the story called for that locale."

Filming on-the-spot in Germany proved a decided asset, however, when it came time to round up authentic World War II German military equipment, available nowhere else in the world. Countless vehicles, many of 1941 vintage — trucks, cars and cycles—were resurrected from automobile graveyards and put into running order as efficient rolling stock of the German Army.

Shooting in Germany and especially at the Bavaria Studio in Munich was nothing new to director of photography Daniel Fapp, who just a year before had photographed much of "One, Two, Three" there. Also, he had the benefit of a substantially Hollywood technical crew — the producer having sent over 27 in all from Hollywood, among them camera operator James Knott, camera assistant Hugh Crawford, and still photographer Jack Harris.

The company also brought along from Hollywood almost all equipment except lights, which were obtainable in sufficient numbers in Germany. But the Mitchell camera, Panavision lenses, two Chapman cranes, and miscellaneous grip equipment were shipped on ahead of the company's departure from Hollywood. Photography was in 35mm Eastman color in the Panavision wide-screen aspect ratio.

POW'S DISCUSS THEIR chances of making successful escape during respite in their laborious tunneling out of German prison camp. The set, over 200 feet in length, was erected on sound stage at German movie studio

The entire production was shot overseas. Originally, it was intended only to shoot the picture's exteriors there, in the black forest region near Munich. But after working there a few days and finding an ideal site nearby for erecting the prison camp plus the fact the facilities of the Bavaria Studio were conveniently near, the company decided to do the entire picture there.

"A big factor," said Fapp, "was the tremendous number of extras required for many scenes of the picture — a requirement which ranged from 300 to 2,000 extras daily. To shoot these same scenes in a mountain locale near Hollywood — say at Big Bear or Lone Pine — would have presented almost insurmountable problems of transportation, feeding and housing. As it was, the German exterior locations where the mob scenes were shot — and where we shot close to 30 per cent of the picture —was only five minutes distant from the Bavaria Studio. This afforded an additional advantage: whenever the weather turned bad, which was frequent, we could return to the studio and shoot interiors."

Munich weather played hob with the company's shooting schedules from the very start. There was snow in July, rain most of the time and very little sunshine. Fapp and his crew had their hands full trying to shoot through the murk and anticipate clear weather. Director Sturges remarked that it was like playing musical chairs. Saving the situation were the score or more Mole-Richardson Brute arc lights which the company wisely had ordered for the production and which Fapp used to maintain consistency in the illumination of many exterior scenes shot on days heavy with murk.

Despite the bad weather and the need to augment daylight with some artificial light, Fapp achieved remarkable photographic results, even when obliged to shoot in rain—which he did on a number of occasions. The prisoners' 4th of July celebration, otherwise known as the "drinking sequence" is one example. Here, the POW's, having secretly brewed large vats of "liquor" in their barracks quarters, bring it out into the open compound for one and all to partake — without interference from the German prison guards.

"It was a dull day when we started to prepare for shooting," said Fapp, "and by the time we were ready to roll the cameras, the sky had become increasingly dark. We moved in more lights and started shooting. It was a lengthy sequence—really too long to shoot in bad weather. But we got started and had to see it through, and had faced up to all kinds of problems by the time the final scene in the sequence had been shot. As it invariable happens, the weather cleared briefly

Continued on Page 354

DIRECTOR STURGES rehearses scene to be enacted on street of small German village, as throng of villagers assemble to watch. Here may be seen the unique German "hatrack" parallels for mounting booster lights. Elevating or lowering the lights is simple, motorized operation

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HITCH–HIKE SYNC

A simple but effective method for recording sound on quarter-inch tape, accurately synchronized with picture.

By PHIL J. FLADD, JR.
All Illustrations By Author

AVAILABILITY OF fair-quality, low-cost, ¼-inch tape stereo recording equipment has brought many sync-sound techniques within the range of low-budget film producers. With a simple sync generator, a synchronous motor-driven camera, and a two-track ¼-inch tape recorder, synchronous double-system sound can be shot quite inexpensively. And with *two* stereo recorders your horizons can be widened to include dialogue looping with guide sound, picture looping, lip-syncing and even narration with an amount of scoring, all before transfer.

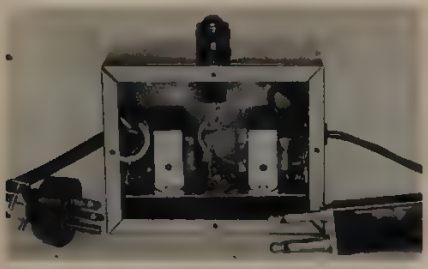

Fig. 1 - Sync generator

First, as the sync generator is basically used only during the original shooting, let's look at its construction. Two standard 6.3 volt radio filament transformers are connected, as shown in Fig. 1. The standard household plug is connected to the primary of one transformer. The secondary is connected to the primary of the other transformer, which has its secondary terminated in whatever type plug matches the tape recorder to which it is to be connected. The two transformers lower the standard 110-volt household voltage to approximately —7 DBM level for safe input. The transformers may be mounted in a suitable case obtainable from any radio supply house. Though not actually necessary, a pilot light connected across the secondary of the first transformer is a convenient and reassuring way to confirm power to the transformers.

When the initial studio or location shooting is being done, the sync-generator records a 60-cycle tone or "sync signal" on track No. 2 of the stereo recorder. The dialogue is recorded simultaneously on track No. 1. The 60-cycle sync signal will eventually assure absolute sync with the picture shot in the camera if the latter is equipped with a *synchronous* motor operating from the same power source. As the tape movement slows or speeds up, the sine waves of the sync signal will be spread or compressed along the length of the tape. Consequently, instead of 1 second = 7½ inches, the ratio will be 1 second = 60 cycles. The sync signal, recorded in the latter ratio, will parallel the dialogue recording on the same dual-track tape.

At the end of the shooting day, normally, the tape is shipped to the lab for transfer to a more compatible and editable material, e.g., 16mm magnetic film. In the lab the sound is transferred from the tape to perforated 16mm magnetic film, and here another ratio conversion takes place: 60 cycles (one second) of ¼-inch tape now equals 24 frames of 16mm magnetic film: sync is once again resolved between sound and picture and editing can take place in a normal manner to complete the film.

Of course, all this presupposes the acoustical qualities of the original recording are acceptable.

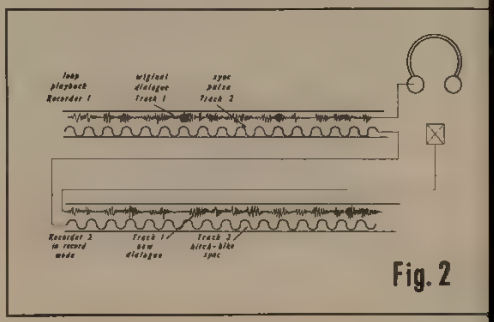
loop playback Recorder 1
original dialogue track 1
sync pulse track 2
Recorder 2 in record mode
Track 1 new dialogue
Track 2 hitch-hike sync

Fig. 2

But if camera or recorder noise level is high, or environmental sounds at the location intrude on dialogue, or the camera angle precludes optimum microphone positioning for pick-up, then what does one do? If *two* ¼-inch stereo recorders are available, the answer is simple. Shoot it, and record the sound anyway. Then, at your convenience in a better acoustical setting, loop the dialogue and "hitch-hike" the sync.

Here's how it works: For safety, first dub a copy of the original sound on ¼-inch tape. Remember to dub *both* tracks; i.e., the dialogue from original track No. 1 to dub track No. 1 and the 60-cycle sync signal from original track No. 2 to dub track No. 2. This dubbing step protects the original tape from cutting errors or tape breakage. Now cut the duplicate into loops of sufficiently short length for the actor to comfortably perform. (See Fig. 3.) Each of the tape loops will contain some words of dialogue on track No. 1, and the 60-cycle signals corresponding to the same pulses that controlled both the camera and recorder for the original scene will be on track No. 2.

The two recorders are connected as illustrated in Fig. 2. Recorder No. 1 track No. 1 feeds the guide sound loop to the actor's earphones. Recorder No. 1 track No. 2 hitch-hikes the sync signal from the loop directly to recorder No. 2 track No. 2. The actor's microphone is connected directly to recorder No. 2 track No. 1. It is important to keep sufficient tension on the tape loop during this operation to assure reasonably constant output level of the sync signal being hitch-hiked. For this, a plastic tape reel resting and rotating in the lower part of the tape loop should suffice. (See Fig. 3.)

The actor, who should be situated in another room free from recorder noise, listens through earphones to his, or for that matter anyone's original on-camera performance played continuously on the loop on recorder No. 1 from track No. 1. His objective is to duplicate the original performance in inflection and timing on track No. 1 of recorder No. 2. At first this process of speaking-while-listening may seem difficult to the embryo actor, but the knack is quite easily acquired.

Transfer of the sync signal is necessary because of possible variation in the linear speeds between the two tapes due to tape slippage and stretch. One of the most reputable professional machines specifies timing to ± 3 seconds in ½ hour, a difference which, of course, would be intolerable. This problem is overcome by hitch-hiking the sync signal from track No. 2 recorder No. 1 onto track No. 2 recorder No. 2. Looping is continued until the actor's delivery matches the original, at which point the post-recorded dialogue will transfer and cut in perfect sync with the original because the identical sync signal has also been transferred, and the need for synchronous drive sprocket equipment is eliminated for this operation.

For looping dialogue while watching a projected picture loop without guide sound, the basic method remains the same. In this case, however, the film itself generates the sync signal and transfers it to the ¼-inch two-track tape. The work print that is to be cut into loops is first striped with oxide, and the 60-cycle signal recorded on the stripe; or, if a magnetic projector is unavailable, a 60-cycle optical track can be electroprinted on the work print. When the film is cut into loops, this same sync signal is

Continued on Page 368

WHEN PLAYING back tape loops, it is important that sufficient tension be maintained on the loops at all times to keep the tape in solid contact with the recorder head and thus assure reasonably constant output level of the sync signal being hitch-hiked.

Fig. 3 - Loops on two transports

ROLL CUE!

. . . a tape-recorded cue system for film narrators.

By GUSTAV E. LANDEN
Cornell University, Ithaca, N Y

THE ROLL CUE SYSTEM in action. Robert Earle, host of CBS's 'The General Electric College Bowl,' narrates a film on the Cornell University sound stage. Wire from recorder, seen between his ankles, leads to concealed hearing-aid by which Earle listens to pre-recorded narration as he speaks.

DURING A FILMING SESSION about a year ago our crew was jokingly called down for using the term "idiot card" on the sound stage. The learned professor remarked, "On the college campus, can't we call them refresher cards or something more befitting the academic climate?"

His remark was in jest, of course, but it pointed up a basic problem of many a film production crew: the shortcomings of visual cue systems for talent appearing before the camera. We decided to do something about it.

An electronic cue system was subsequently developed at the Cornell TV Motion Picture Sound Stage which has been highly successful in various phases of film production. First, with electronic cueing, our production time is cut to a minimum. Less time is needed for rehearsals because no memory work is necessary. The second and possibly the most important problem the cue system solves is that of retakes due to the talent's lack of "eye contact" with the camera lens. The electronic cue system permits the narrator or actor to keep his eyes right on target. A third production bonus is that of retention by the talent of the instructions given by the director before the cameras roll. A fourth and final benefit is the gain in overall production quality due to the acting or projection of more personality into the talent's performance.

Our cueing system frees the talent of script problems and lets him concentrate on performance, the visuals used, camera shifts, and all of the finer points that many producers would like to add to their productions.

Any film producer with a little imagination, a ¼-inch tape recorder, a few feet of plastic tubing, a hearing aid earmould, a $1.49 earphone, and lots of wire can set up his own electronic cue system as we have done.

The system works in this fashion: The talent does a walk through, script in hand, and records on ¼-inch tape the dialogue or narration for upcoming scenes in their proper shooting sequence. The director has, of course, gone over the actions with the talent, and time for action is left or spaced on the tape. There are times when verbal reminders are added to the tape such as directions for certain movements, or "Show such and such an item to camera 1," or "Turn to camera two," etc. Such

Continued on Page 367

SOUND FROM hearing-aid earphone is piped through flexible tubing to earmould in subject's ear. Earmould is used because it is smaller, less conspicuous than earphone.

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"JOURNEY

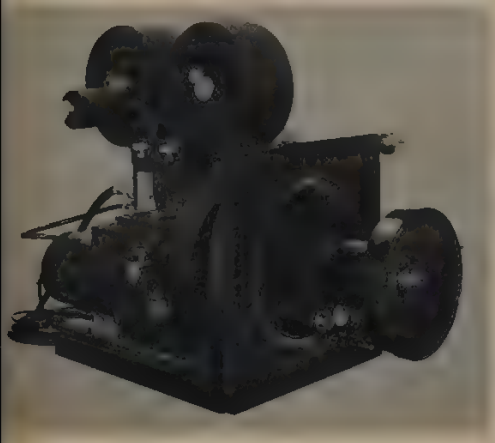
Space-age movie in hemispherical format required novel wide-angle photography and vertical projection on dome-shaped screen.

By DARRIN SCOT

SPECIAL CINERAMA CAMERA shown above, equipped with 0.9-inch, f/2.2 inverted telephoto lens and using 70mm film was employed in photographing "Journey To The Stars," much of it in single-frame exposures

LINING UP a dolly shot. Camera door is open, permitting adjustment of mechanism and focusing. Saturn-type satellite model in background is one of several miniatures constructed for the production and shot against black backdrop

CINERAMA CAMERA CORPORATION'S super-wideangle 70mm camera with "bug-eye" lens features frame counters, forward and reverse operation, single frame photography, dissolving mechanism and special shuttering affording long exposure times per frame.



WHEN THE SEATTLE WORLD FAIR opened last summer the "hit of the show" was the Spacearium featuring a new space motion picture system created and constructed by Cinerama for the Boeing Co. and the United States Science Exhibit. Inside the U.S. Pavilion a 15-minute color film, "Journey to the Stars," was projected on a hemispherical 360-degree, 75-foot screen, filling the 6,000 square foot surface with all the excitement of an actual trip to the outer galaxies. During the run of the Fair, standing audiences of 1,000 at a time viewed the spectacle. It played more than 6,000 performances before an audience totalling 4½ million people and springboarded the formation of a vital new company serving the motion picture and missiles industries, the Cinerama Camera Corporation.

TO THE STARS"

The story behind the development of the Spacearium filming and projecting systems is one of remarkable technical achievement. The challenging assignment called for a totally new concept of motion picture presentation including the design and construction of photographic equipment, optics, special processing, printing and film-handling equipment, projection, a giant dome-shaped screen, a film production involving intricate three-dimensional animation and a precisely engineered auditorium in which to screen it—all to be completed in less than fourteen months.

Cinerama, Inc., was designated prime contractor to work with a group of sub-contractors including Fine Arts Productions (film production), Fairchild-Curtis (optics), Benson-Lehner Corporation (photographic and projection equipment), Film Effects of Hollywood (printing equipment, optical effects and release printing), Technicolor, Inc. (processing) and many others.

Program Manager and Co-ordinator of the project, William D. Liittschwager, realized that the challenge was far different from that of normal motion picture production and that the first logical step was one of experimentation with standard and

FILM IMAGE IS projected vertically on overhead screen by this special Cinerama projector to produce a full 360-degree hemispherical picture of star-studded heavens. Here operator makes focus adjustment before starting run of film.

SEATTLE WORLD FAIR visitors view 'Journey To The Stars' projected overhead on dome-shaped screen. The 15-minute color film was screened for more than 6,000 performances during 1962, was seen by an audience estimated at 4½ million.

available equipment to prove the feasibility of the system. For this he borrowed from Naval Training Devices an inverted telephoto lens having a 142-degree field and originally designed for use in Naval Gunnery Training. With this lens, a Bell & Howell camera and a 35mm projector, Fine Arts Productions began shooting tests and experimenting with projection onto a 20-foot dome. Concurrently, Benson-Lehner began developing the 70mm production camera, adapting it from a 2¼"x2¼" frame-size model originally designed for photoinstrumentation work. This camera had to be modified for animation photography and fitted with optics yet to be engineered.

The camera utilized ASA Type 1 perforated film, having a .234 pitch. The mechanism was modified to permit stop-motion photography and included such refinements as frame counters, forward and reverse operation, thru-the-lens viewing, critical focus adjustment, a dissolving mechanism and special shuttering devices for exceptionally long exposures. A method was also devised to mount the camera on an animation crane so that it could be rotated in increments of 1/10 degree in any direction.

Curtis Optical, assigned the task of designing the lenses, delivered the first one—a 0.9-inch focal length, f/2.2 inverted telephoto—which could be used for both photography and projection. Its resolving characteristics were of a very high order 500-600 lines per millimeter visually on axis and 70-80 on film, with virtually no vignetting at the

Continued on Page 364

Fig 1—New Eclair 16mm camera design provides solid support for hand-held shooting

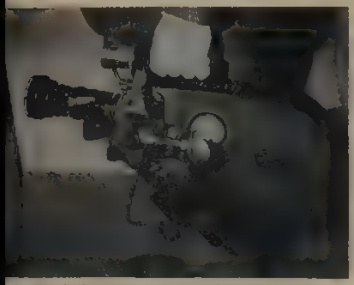


Fig 2 Unorthodox in design but easy to carry

Fig 3—Dual spool magazine includes film movement

Fig. 4—Eclair camera motors are interchangeable.

REPORT FROM

Growing importance of professional 16mm film production reflected in design and innovations of new cameras shown at Photokina-'63.

By HANS KOEBNER
Munich, Germany

THE PROFESSIONAL cinematographic equipment displayed at Photokina-1963, concluded recently in Cologne, reflected the growing importance of 16mm in the production of industrial, commercial and television films. It also reflected the special attention to both design and performance which manufacturers have given their equipment to meet the need for compact, functional and lighter-weight cameras. While the Photokina exhibits were not limited to cameras alone, it is with the new or improved professional 16mm cameras displayed which this report is concerned.

Arri had all its camera equipment on display in its booth, including the new Arriflex 16M, which is a mirror-shutter reflex camera designed to take external film magazines. The provision for 100-ft. internal film loads, found in the earlier Arri 16, has been eliminated in favor of a more compact camera box, which will accommodate 200-ft., 400-ft., and 1200-ft. magazines. A built-in sync-signal generator simplifies the camera's use for 16mm sound-film production with remotely operated tape recorders.

Also new was such Arri equipment and accessories as the feather-weight blimp (Fig. 6). Designed especially for the 16M, the blimp is constructed of plastic layers, weighs but 13 kg. (about 29 lbs.), and may be had in black, white or a range of colors.

New, also, for the Arri 16M was the 300-meter (about 1000-ft.) casette—a single compartment film magazine in which the film rolls are mounted side-by-side. Pictured in Fig. 5, the casette weighs 4.2 kg. (about 3 lbs.).

Considerable attention was focused on the Zeiss retrofocus Mirotar 1, a 500mm f/4.5 lens which can be used with either the Arriflex 16 or Arriflex 16M. It weighs 4.4 kg. (about 3 lbs.) and requires a special cradle for support before the camera, as may be seen in Fig. 7.

A truly brand new entry in the Photokina display this year was the new Eclair 16mm professional camera from France. (Figs. 1 to 4 incl.). Highly unorthodox in design, the camera nevertheless has excellent balance for hand-held operation. Among its many features are the facility for quick interchange of electric motors of different speeds and voltage requirements, a detachable film magazine, a sync-signal generator, and two-lens rotary turret.

Fig. 1 is side view of the camera, showing how both the magazine and motor rest on operator's shoulder to give solid support for hand-held shooting. The white disk (there's one on either side of the magazine) is for making pencil notations, etc., relative to the film content. The zoom lens—a 12-120mm is from Angenieux.

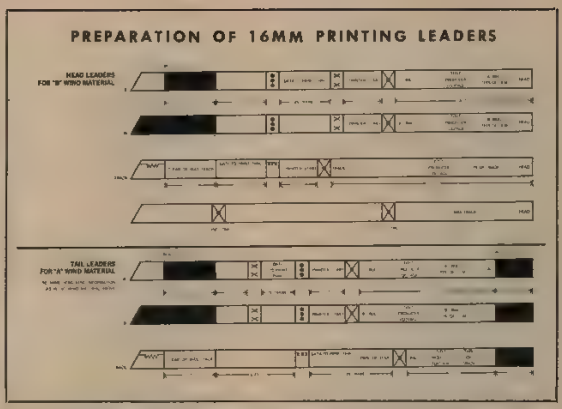
Continued on Page 363

COLOGNE

Fig 5—1000-ft single chamber film magazine for the new Arriflex 16M camera

Fig 6—Featherweight blimp for the Arriflex 16M.

Fig 7—Zeiss Mirotar lens fits Arri 16 or 16M.



THE ACCEPTED PROFESSIONAL method of preparing and marking 16mm printing leaders as a guide to the laboratory is illustrated in above chart, issued recently in 11"x16½" format by General Film Laboratories, Hollywood, and reproduced here by permission

The preparation of

16MM PRINTING LEADERS

THE 16MM EDITED FILM received for printing by laboratories is usually edited in A&B photo rolls, with a separate sound roll either 16mm photographic (optical) printing track or magnetic tape or film. The film leaders are attached, labeled with the usual information: Head, Title, Producer. Type of film, etc. (See illustration above.) and marked for sync. Somehow, in spite of all this, a new show occasionally will be printed out of sync. Why?

Well, first granting that the laboratory itself can make a mistake, most such out-of-sync errors trace back to either one of two things: the labeling of the sync mark or marks, and the advance of the sound track made for printing sound with picture.

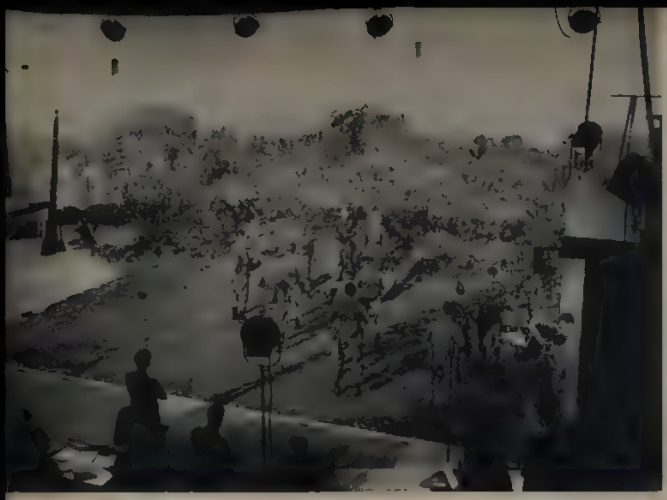
Let's take up the sound advance first. Since a 16mm projector's optical sound reproducing head is 26 frames *after* the light aperture, the sound track on a 16mm print must be 26 frames *ahead* of the corresponding photo frames. When the track is advanced 26 frames, the speaker will reproduce the sound that belongs with, or "is in sync with" the picture being projected on the screen.

Once a new film editor grasps this point, marking the film becomes simple. All he need do is count toward the foot (or tail) end of the roll 26 frames from his Edit Sync, and mark the 26th frame "Print Sync."

The problem seems to be that the person who doesn't edit regularly, but only occasionally, tends to forget which way to count. So, a laboratory will occasionally get film with the sound leader print sync marked 26 frames ahead, instead of being retarded. If printed according to such sync mark, the sound print will be 52 frames out of sync.

And, there is the case of the producer who marked the correct frame for his printing sync, but didn't label it before answering a

Continued on Page 370



APC CREW shooting scene on Army Pictorial Center sound stage, using techniques, lighting and equipment comparable to that found on Hollywood sound stages. Here may be seen the large painted backdrop backing up greenery of simulated exterior, all adequately lit for full day-time effect by overhead lighting units, some of which were constructed by APC's electrical department

JOE LIPKOWITZ, left, Chief of APC Camera Branch, and Charles Hemingway, of APC's Special Effects Branch, inspect Mitchell Camera used in filming special effects. (U.S. Army Photo)

When The Army Has Shooting To Do....

. . . it all begins at the Army Pictorial Center in Long Island, New York, where complete major studio facilities enable staff of civilian and Army-trained cinematographers and technicians to produce motion pictures of high professional quality.

By GEORGE J. MITCHELL
Lieut Colonel, U.S. Army, Retired

MOTION PICTURES were an important training aid in preparing the United States for World War II and the subsequent Korean conflict. Through the use of Army training films, soldiers were given instruction quickly, cheaply and with a uniform standard of excellence in all military subjects from weapons to battlefield survival.

Advances in the technology of warfare, coupled with the advent of nuclear weapons, require today's soldier to be able to absorb greater technical knowledge about more complex machines and weapons in a shorter time than ever before. Hence, the training film and its more recent companion, television, is playing an increasingly important role as one of the Army's most effective training aids in this atomic age.

The Signal Corps is charged with the responsibility of all motion picture production. Its major operating arm for actual production of films is the Army Pictorial Center—commonly known as APC—which occupies five large buildings covering nearly four city blocks in Long Island City, New York and includes the former Paramount eastern studios.

Over 1,000 military and Civil Service employees, skilled in all phases of motion picture and television production, are employed at the Center, making it one of the busiest non-theatrical film studios anywhere in the world. The studio's personnel—men and women—comprise many different talents and crafts, including producers, directors, writers, cinematographers, carpenters, grips, film editors, sound experts, animators, set designers, costumers, make-up experts and property masters. The motion pictures, video tapes and TV recordings produced by these

people illustrate in vivid imagery the tactics, techniques and doctrine of combat survival.

The Army Pictorial Center is similar to many other military installations, containing such familiar sights as a barracks, medical dispensary, Military Police Provost Marshal, Post Engineer, Officer and NCO clubs, a post newspaper (appropriately named *In Focus*) and the inevitable Post Exchange or PX. But, the big, block-long main building housing the five giant sound stages—one of which is among the largest in the United States—make it considerably different from other Army posts. The Center is comparable to a major Hollywood studio, with all the latest equipment and talent necessary to produce highly professional motion pictures and television recordings.

Although the Signal Corps has been actively involved in training film production since about 1909, it was not until 1942 that the present well-equipped plant was acquired. It was purchased from Paramount Pictures Corporation for $500,000 in what one APC officer terms "the best real estate deal since the Indians sold Manhattan for $24."

How does an Army training film come into being?

Edward L. Scheiber, Deputy Chief of the Production Division (that part of the Center which coordinates and supervises all production) illustrated and explained to me how this is done with a series of graphic illustrations on a chart in his office.

First, subjects are proposed by the combat arms—Infantry, Artillery, Armor—or by the various Technical and Administrative Services like the Signal Corps, Quartermaster Corps, Military Police Corps, Intelligence Corps, Engineers, Ordnance Corps and the Women's Army Corps. A script is then prepared by an APC writer working closely with the originating agency's technical adviser.

The resulting script is then circulated to interested agencies and finally is approved by a panel presided over by the Deputy Chief of Staff for Military Operations at Department of the Army level. Army Pictorial Center supplies the time and cost estimates and the requesting agency furnishes the necessary justification.

A Project Officer (producer) is assigned to take charge of the production and a director is selected. Together, they begin to coordinate with the various branches of the Production Division that will furnish the technicians and equipment: camera, editorial, sound, film, stock shot library, animation, art, props, grips.

The shooting schedule is made up and a cost breakdown is prepared. The Project Officer and Director begin casting the players. Professional actors are engaged through the Screen Actors Guild for all films. Military personnel are used only for technical demonstration and only then if they have an acceptable screen presence.

While the cast is being selected and rehearsed, sets are built and

ON LOCATION at Ft Benning, Georgia, APC camera crew shoots escape and evasion scene for film dealing with code of conduct. Cameraman is Harry C Kreider (U.S Army Photo.)

props assembled. The shooting gets under way either on location or on the sound stages at the Center. Considerable location work is done at various Army installations throughout the United States and overseas; however, maximum use is made of the studio. Background projection and stereoptican

Continued on Page 358

AIR VIEW of Army Pictorial Center, Long Island City, N.Y. 1—Motion Picture Studio (formerly Paramount's Long Island studio); 2—TV studio, 6—Finance & film depository building; 12—Film vaults; 13—Film lab and technical maintenance building; 21—Paint shed; 23—Film storage; 24—Enlisted men's barracks; S-25—Self service building; S-27—TV maintenance; S-28—Post Engineer. (U.S. Army Photo.)

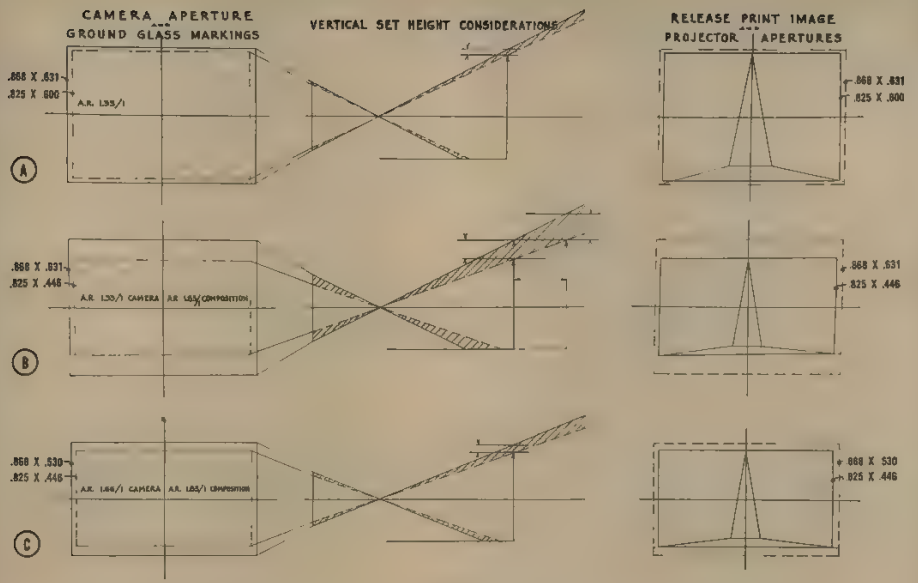


Fig. 1

Wide Screen Films And Television

Wide-screen feature films are more readily adaptable to television if certain framing considerations are observed at the time they are photographed.

By WALTER BEYER
Chairman, Research & Educational Committee of the ASC

When the Research & Educational Committee of the American Society of Cinematographers convened in a special meeting early this year, its purpose was to explore and seek a solution to the problems involved when wide-screen feature films are televised. The aspect ratio of a feature film photographed 185-to-1 is not compatible with the less-rectangular format of television screens, and such pictures, when televised, appear on the screens of TV receivers with objectionable wide frame lines, top and bottom.

The Era of Aspect Ratios

Ten years ago, one of the most stimulating conversation pieces at studio production and engineering meetings was the elusive "aspect ratio." Prior to that time all apertures—both for cameras and theatre projectors—was the Academy Standard, 1.33-to-1 (1.33:1). The advantage of this aspect ratio with relation to set construction is illustrated at A in Fig. 1. On sets, placement of microphones and lights was most advantageous, and with the proper head clearance and the minute difference in height between the camera and projector apertures there was never a problem concerning "over-shooting" a set or in providing a "protection" area when framing scenes in the camera finder.

With the introduction of wide screen photography, shooting in any aspect ratio other than 1.33:1 created a number of problems relating to the economics and technicalities of production. Those who participated in the battle of the aspect ratios at that time will understand that it would far exceed the scope of this report to mention all of them here.

However, it all boiled down to a decision to establish 1.85:1 as the composition area within the standard 1.33:1 aperture, as shown at B, in Fig. 1. Composing a 1.85:1 "ribbon" inside the 1.33:1 camera aperture required new finder and ground glass marks; and, of course, microphones and lights had to be placed safely outside the so-called "protection" areas. This meant constructing sets with higher walls than actually were needed for 1.85:1 composition.

There now ensued a lengthy period of inter-studio technical discussions on the matter of what should be protected—a subject which continues to be debated today. Some of the studios decided to leave camera apertures at the established Academy Aperture dimension; others now used the full, standard aperture of the camera, protecting more or less the areas above and below the 1.85:1 "ribbon" area with the consequent risk of having mike or gobo shadows occasionally appear in this area of the film.

It should be pointed out that such "protection" areas as I have described at once introduce uncertainties: The director of photography can never be absolutely sure that all extraneous mike shadows, etc., will never be seen on either the theatre or TV screen. It introduces problems for the camera operator, too; but worst of all is the fact that such protection areas, above and below the 1:85:1 composition lines, permit careless projectionists to misframe the picture, virtually re-composing it—not at all compatible with the original esthetic values of composition and story-telling impact.

To support the majority decision to compose and photograph wide-screen pictures in the 1.85:1 format, several studios reduced the protection area to as little as possible and have provided camera hard mattes (camera apertures) having a height ranging

Continued on Page 352

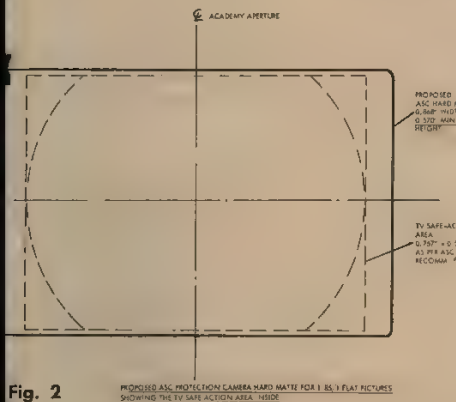


Fig. 2 PROPOSED ASC PROTECTION CAMERA HARD MATTE FOR 1.85:1 FLAT PICTURES SHOWING THE TV SAFE ACTION AREA INSIDE

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WIDESCREEN FOR TV

Continued from Page 351

between 0.530″ and 0.536″. A visualization of this situation may be seen at C in Fig. 1. Here it is obvious that the vertical situation is now under control and over-shooting and set height requirements are almost comparable to those required for the old 1.33:1 aspect ratio, illustrated at A in Fig. 1.

This latter step was undoubtedly well-meant, but of course resulted in prints best suited for the theatre; and, having wide frame lines, not enough picture information is provided on the film frames to meet the requirements of standard TV screens in the event such films are subsequently exhibited on television.

Because more and more feature films are being made available to television, it is essential to consider that all future film productions may eventually reach the television market and to remove all technical stumbling blocks that may jeopardize the use of such films on TV. The need is for standardization that will benefit both motion picture producers and the television industry.

The Wide Frame Line Bugaboo

To acquaint the less-informed reader with the film frame height situation involved in this problem, the following information will be helpful: The picture aperture of the 35mm projector employed in TV stations in the transmission of motion pictures has a height of 0.612″. The height of the transmitted area inside this field is 0.594″. The height of the safe action area is 0.565″, and the wide-frame line release print presently has 0.536″ maximum picture information on the film. That the frame lines of such prints may show on TV screens is at once obvious. It is this situation which this Committee presently is attempting to correct. (For more complete details on aspect ratio dimensions, etc., refer to the Committee's report on ASC Recommendation No. 4 published in *American Cinematographer* for May, 1962, pp. 272).

The following report by the Committee Chairman, released in April, is self-explanatory and is reproduced here to bring readers up to date on this project and to reveal something of the activities of the Research and Educational Committee of the ASC:

THEATRICAL WIDE-SCREEN VS. TV-RELEASE ASPECT RATIO CONSIDERATIONS

It was first pointed out in my article in the *American Cinematographer Manual*, published in October, 1960, (pp. 17) that the reduction of camera hard mattes to suit the 1.85:1 aspect ratio only would result in wide frame line prints—not too welcome for the theatre and absolutely undesirable in regard to future release of theatrical films for television.

This problem was again the main reason for establishing ASC Recommendation No. 8, issued April 30, 1962, and subsequently published in *American Cinematographer* for June, 1962, pp. 366. The drawings on pages A and B of that recommendation are self-explanatory.

On January 15, 1963, a joint meeting of members of the ASC and SMPTE was held to discuss the problem, with the participation of representatives from ABC, CBS, AND NBC networks. (See *American Cinematographer* for February, 1963, pp. 68). The basic points established were as follows:

The major networks will refuse to telecast wide frame line prints of motion picture films. They will consider as "non-standard for TV release" any print that does not have sufficient printed picture information to fill the 0.816″ X 0.612″ aperture of the networks' 35mm TV film projectors.

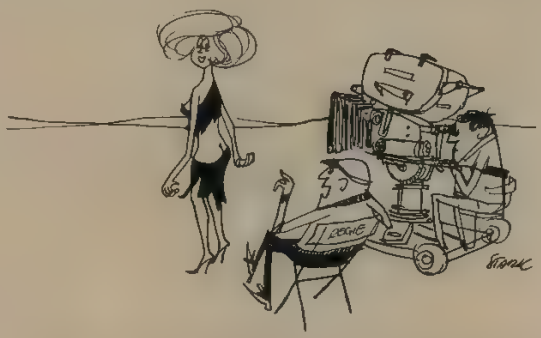
There is full understanding for the fact that economic and technical reasons have caused studios to reduce picture height from 0.600 since composition for 1:85:1 aspect ratio plays only between 0.477″ which, even for 1.66:1 protection requires no more than approximately 0.530″ picture height for presentation of the film on theatre screens.

The chairman outlined the details of all problems with the aid of charts and celluloid overlays to demonstrate the incompatibility of the 1.85:1 production method and 1.33:1 aspect ratio TV home receivers.

No definite solution was reached at the termination of the meeting. Among the many proposals offered by the Committee Chairman was enlarging camera hard mattes to a height of 0.565″ from the approximate present height of 0.530″ a move he considered a logical middle-of-the-road solution inasmuch as this dimension is the same as the presently recognized height of the TV safe action area. From 0.565″ to the transmitted height of 0.594″ is a differance of 0.029″ or only 0.0145″, top and bottom, which should not be considered by the networks as an objectionable frame line to appear on home receivers.

Subsequent to this meeting, Mr. Ray Johnson, head of the camera department at M-G-M Studios, prepared a short wide-screen test film that demonstrated the results of a scene photographed with three different 35mm camera apertures: full TV aperture height, 0.536″, and 0.565″. The following is a condensation of Ray Johnson's report to the ASC's Research and Educational Committee:

"In association with Walter Beyer



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of Universal City Studios, we viewed this film on several closed circuit setups at NBC, ABC, and CBS A résumé of the comments by the network engineers follows:

NBC The wide screen test did not show frame lines on NBC's monitors and it was felt that they should not show on any home receiver. However, NBC wanted picture information beyond what they could see on the monitors. In other words, they wanted the full Academy aperture used whether they could see all the picture or not This seemed rather an unreasonable attitude and I feel that it can be changed at a higher management level.

"*ABC*—The wide screen test film was received favorably. ABC stated that we no longer had a wide frame line problem.

"*CBS* Showing our wide screen test film on a viewing room monitor, the black frame lines encroached upon the picture area slightly, top and bottom. We then viewed the film on a different monitor one similar to a home receiver. On this equipment we saw a normal picture without objectionable frame lines. We again viewed the film on a different set of monitors with similar results. We then asked CBS whether they would accept wide screen feature motion pictures for televising if they were photographed in this manner.

"Without assuming to speak officially for the network, it was stated by the spokesman that the results appeared acceptable. He added, however, that a picture having more picture information, top and bottom, would be preferred.

"Following our discussions, it was generally agreed that an increase of .005" in the height of the protection area, making it .570", would be desirable."

Conclusion: As Chairman of the Research and Educational Committee of the ASC, I am of the opinion that as long as the industry is making pictures for the theatrical market it is understandable that management wishes to put its best foot forward in that direction.

I consider the solution to establish a minimum camera aperture height of 0.570" in order, since it does not cause a seriously inferior presentation of motion picture films on television. In fact, this proposal, as unmistakably demonstrated with the test film described above, will satisfy the needs of both film exhibitors and TV networks.

Walter Beyer
Chairman
Research and Educational Committee.
April 25, 1963.

All action taken by the author and the Committee members has, so far, been based on oral information that networks can and will refuse to accept for telecasting wide-screen prints that would result in display of frame lines on home receivers. Although the Committee feels its efforts have progressed toward a solution of the wide frame line problem, it has, in the spirit of mutual cooperation, forwarded a copy of the above report to representatives of the three major TV networks with the specific request that they state in writing their respective policies.

In the meantime the Committee regards the established dimensions, shown in Fig. 2, as an interim solution. If confirmed in a subsequent finalizing meeting of the Committee, they will be published as an official ASC Recommendation. It is our conviction that, for the benefit of directors of photography, camera operators and all film production personnel involved in this matter, we are on the right track in establishing again one common aperture for the photography of all flat motion pictures. ■

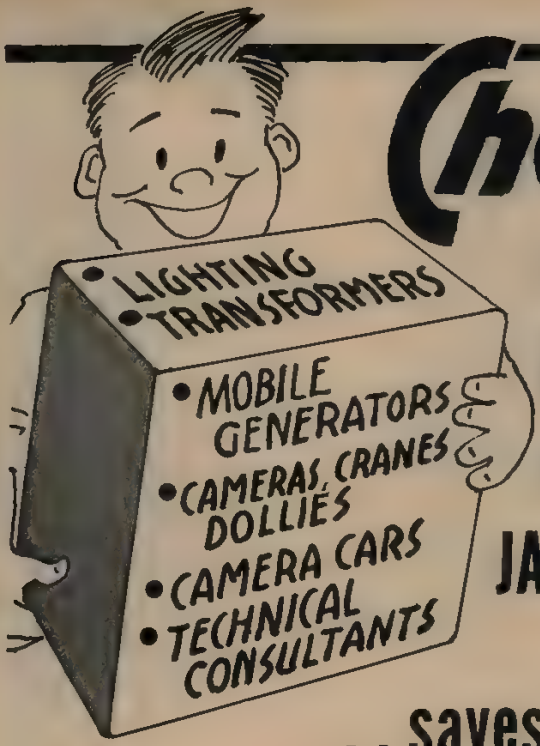
"THE GREAT ESCAPE"

Continued from Page 338

a few days later, and then it was determined that we had some added scenes to shoot for the sequence. This made it necessary to wait for the weather to turn cloudy again so that the added scenes would match the scenes previously photographed."

It is situations such as this where a director of photography's skill and artistry is put to the supreme test. There is more to it than simply shooting added scenes. The quality of lighting in the scenes previously shot must be remembered as also must the camera position and the movements or exits, right or left, of the players in camera range—all this if the added scenes are to properly match and intercut with the previous photography.

Other examples of Fapp's commendable photography achieved under "impossible" lighting conditions are the



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scenes of two POW's escaping by row boat on the Rhine river—shot entirely in light rain, with the lens set at f 2.8 most of the time; and the suspensive sequence of scenes in which a number of recaptured prisoners are taken by truck to a lonely spot in the country, turned out and coldly machine-gunned. The dour, cloudy day exactly matched the mood of these terrible scenes and Fapp's photography and skillful lighting give the sequence powerful pictorial impact.

Much of the picture's exciting action takes place in the underground escape route laboriously dug beneath barracks and compound by the prisoners while German guards vigilantly policed the camp grounds. The set representing a cross-section of the tunnel was extensive—about 200 feet in length—and was constructed on a sound stage of the Bavaria Studios. In its design and construction, Director Sturges insisted that it be kept as narrow in depth as practical so that both the ceiling and the base of the tunnel would appear in the picture frame. It was important, he said, to maintain the visual effect of extremely cramped quarters the prisoners had to work in as they inched along toward freedom with their laborious digging. As the tunnel length grew, the prisoners extended the crude wooden tracks over which they moved low-slung carts to carry the excavated soil—and later the prisoners themselves as they were transported one by one from the secret exit in the barracks floor to the end of the tunnel and freedom.

Here the photography was extensive and required several days to complete. Most of it was mobile camera shots, with the Mitchell camera dolly-mounted and moving on tracks parallel to the tunnel set. "The wide scope of our Panavision lenses," said Fapp, "precluded panning the camera."

Lighting of this set was predominantly low-key and it was an important factor in the build-up of suspense which the feverish action in the tunnel generated. Compatible with the grim mood of the scene, the lighting was deliberately underplayed, yet was adequate at all times to afford easy discernment of action and players on the screen.

As the prisoners began digging their escape tunnel, they used candles for illumination. Later, they fashioned "oil lamps" from discarded tin cans and wicks made from strips of cloth, which burned fat obtained from the compound kitchen. Fapp played irregular spots of yellow light on the tunnel wall back of these lamps to simulate the glow of the tiny flames. In shooting scenes of the men moving through the tunnel one at a time on the rickety, low carts, a Baby Junior mounted on a second cart moving along in front of the players properly illuminated them for photography.

There is another sequence in this picture that particularly stands out, both for the photography and the execution of it. It is the crashing of a light, single-motored plane in which two of the escapees are attempting flight to freedom. "Logically, we did all of the close shots before the plane was actually crashed," Fapp explained. The spectacular crash was no special effects job; it was a deliberate crackup by an expert flyer, without injury to himself.

"To film the pre-crash close shots depicting the 'crashed' plane nosed over and burning at the edge of a forest," Fapp explains, "the plane was angled over as required and a number of broken tree limbs and some uprooted brush arranged on and around it. Some combustible material was then ignited within the setup to give the illusion that the plane with its occupants inside was afire.

"After all the close shots were completed," Fapp continued, "the big, spectacular crash scene was staged and photographed. This was a one-time, one-shot, no-retakes operation and every precaution was taken to insure getting the action just right on film. With everything in readiness, we started the cameras rolling as the pilot headed our way, as instructed. He brought the plane in low among the trees. The right wing caught a branch, veered into a clump of trees and crashed. It was a perfect take.

"The only process shots involved in this whole sequence," Fapp continued, "were closeups of actors James Garner and Donald Pleasance seated in the plane as it ostensibly moved in flight. The shots were done in the Bavaria studio using a single-head process projector, which just barely gave us the volume of light required for the process shots."

These are but a few of the photographic highlights of this dramatic and suspensive motion picture—the third, which Daniel Fapp has photographed for The Mirisch Company. For the photography of "One, Two, Three,"

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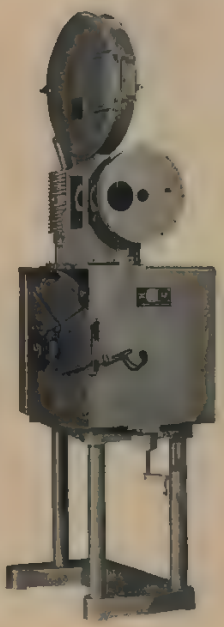
1. Le regulateur de voltage d'intensité d'eclairage.
2. La lampe de 500 watt est nécessaire pour les films de 16mm, et de 1000 watt, pour les films de 35mm (un ventilateur est mise pour rafraichir la chambre de la lampe).
3. L'objectif de 2½ est instalé.
4. La manette de mise en marche et d'arret controle en meme temps la lampe et le moteur.
5. La boite de films avec noyau peut contenir 3000 pieds du films.
6. La roue supérieure est construite de maniere de recevoir le film dans les deux directions, nourrie par la bobine centrale.
7. Une roue est instalée pour libérer rapidement le film de la boite.
8. La lampe se trouve pres de la bobine recepteuse, et donne toute facilité pour inspecter le film a main dans le projecteur.



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2. Lampada di 500 watt per 16mm e di 1000 watt per 35mm.
3. Obbiettivo di proiezione di 2½".
4. Maniglia per controllo di motore e lampada di proiezione.
5. La cassetta porta pellicola puo contenere 3000 piedi.
6. I rulli superiori di guida sono construiti per operare con film provenente di ambi lati della bobina svolgitrice.
7. Disco con montatura sporgente nel magazzino.
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Fapp received an Academy Award nomination last year for best black-and-white photography. Simultaneously, the same year, he was nominated and won the Academy's Oscar for best color photography for the award-winning "West Side Story."

Of "The Great Escape," Fapp says simply: "Our chief aim, photographically, was to sustain mood and to aid in building suspense. It was a very factual picture; we didn't try to glamorize anything at anytime."

All negative shot on the production was shipped by air to DeLuxe Laboratories in Hollywood, where it was processed and "dailies" printed. Shipments of exposed negative were made three times weekly. The laboratory air-expressed "dailies" to the company on location on a similar tri-weekly schedule. "The frequent arrival of 'dailies'," said Fapp, "enabled us to keep close check on photographic results — very desirable in view of the adverse weather in which so many exterior scenes were photographed." ■

WHEN THE ARMY SHOOTS

Continued from Page 349

transparencies are used whenever possible to hold down costly location trips. But it is not unusual to find as many as a dozen companies working in such varied locales as Fort Benning, Georgia; Fort Sill, Oklahoma; Korea; Fort Richardson, Alaska; South Viet-Nam; Germany; France; Fort Bliss, Texas; and Fort Ord, California. At the same time several other units may be working on the sound stages.

Any necessary animation and special photographic effects are usually prepared at the same time principal photography of a production is under way. When all photography is completed, the film is edited and the rough cut approved. Narration, music, and sound effects are added. Re-recording is accomplished and the "answer print" is sent to the requesting agency for approval. If the film is approved and no re-takes or re-editing is necessary, the Center's processing lab makes up the release prints. In the final phase, the release prints are sent to Signal Corps Film Exchanges throughout the world for distribution.

Training films have been made covering in detail virtually all subjects taught in the Army. But tactics, weapons, equipment and technology change. New films must be constantly produced. Whenever possible, old films are updated. For example, it is not always necessary to completely re-make a film but it can be frequently brought up to date by photographing new scenes to keep abreast of new technical developments and changes in policy or tactics. This economical practice has saved many thousands of dollars.

Films are also revised, re-narrated and lip sync'd for use by Allied nations. Army training films have been translated into many different languages and are given wide dissemination by Army military advisers on duty with friendly nations throughout the world.

The running time of most training films is held to about 20-25 minutes. A study was made by Army psychologists who determined that most students cannot satisfactorily assimilate more from a lengthier film. Long, involved subjects such as infantry tactics, artillery firing, map reading, guided missiles are issued in episodes.

The use of color in training films is dictated by several important considerations: time, money and teaching effectiveness. For most military subjects, it has been found that black-and-white film will do an effective job. But there are certain subjects like camouflage, medical and guided missile subjects where color recognition is of paramount importance. In such cases, color is employed because it can do a more effective teaching job.

The operation of the Camera Branch (which is under the overall supervision of the Production Division) offers a typical example of how one of the APC technical branches functions and is staffed.

It is headed by Joseph J. Lipkowitz, who joined the Center with the first detachment of soldiers back in 1942, and who has had more than 25 years experience as a cinematographer. Prior to enlisting in the Army, Lipkowitz had been a professional cinematographer. After the war ended, Lipkowitz was offered a job with the Army as a civilian cameraman. For several years he was a production cameraman at APC and worked on all types of films before being appointed branch chief.

The Camera Branch is divided into three main sections: motion picture, still photography and special photographic effects. The Branch is responsible for the photography in all APC

projects; assigns personnel as a part of a production crew or on location; furnishes the camera crews with necessary equipment; accomplishes special effects and process photography; and requisitions, tests, stores and issues and maintains records of cameras, auxiliary equipment and raw stock.

At this writing, the following first cameramen are assigned to the Camera Branch: Master Sergeant Hiroshi Kaku, Sergeant First Class John Marsten, Sergeant J. D. Devan, Sergeant William H. Wilson, Sergeant Alzen Floyd, Specialist 5th Class James O. MacIntosh, Frank Argondizza, Charles N. Arnold, George R. Howell, Charles B. Hemingway, Harry C. Kreider, Christopher Mauriello, Robert E. Sullivan, Stanley T. Swed, Vibo V. Valenzio and Peter R. Voutsas.

Lipkowitz said that many of the civilian cameramen have been at APC since World War II. Surprisingly, most of the military cameramen now assigned to the Camera Branch received all of their training and experience in the Army. Soldiers are given basic training in photography at the Signal Photographic School at Fort Monmouth and acquire additional skill through "on-the-job training" and experience. Lipkowitz has set up his own training program for new men and keeps it going as often as he can despite a heavy workload.

"A soldier has to have the aptitude and the interest to become a cameraman," Lipkowitz says. He claims that it is possible to determine early whether or not a newly-assigned soldier-cameraman has such aptitude or inclination. He told me that it takes about two years to train a capable *assistant* cameraman. "Skill in lighting, composition, and actual production photography come only with experience, and a lot of that. You really can't teach those things. Such skills must be acquired over a long period of time," is his opinion.

Christopher Mauriello is a typical APC cameraman. He has been an Army cameraman for more than 20 years both as a soldier and civilian. He was a combat cameraman with General Douglas MacArthur's forces in Australia early in World War II and followed his armies through the various South Pacific Island campaigns until the war ended in the Philippines. Mauriello was one of several combat cameramen assigned to cover the infantry assault on the Island of New

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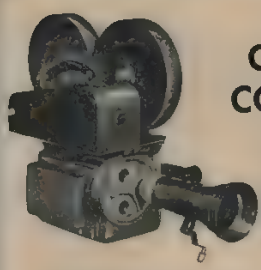

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Britain in 1943.

"I was pretty keyed up and more than a little bit scared but I had been briefed over and over on the sort of pictures desired," he told me one day when I visited a set he was working on. "When we hit the beach, I bounded out of the landing craft and started covering the action with my Eyemo. The trouble was, in my excitement and preoccupation with the photography, I forgot to keep under cover.

"The troops were scattered along the beach behind whatever cover they could find. I would make a shot and then run up to the fellows and ask for their names and units. We were supposed to send that information along with the exposed film. The boys must have thought I was a complete nut running around with a camera and asking such silly questions, especially when the Japs were throwing plenty of fire in our direction. Finally, an officer pulled me down before I got hit. When I realized what I'd been doing, I *really* got scared. It's funny what a cameraman will do sometimes just to get a good picture!"

After the war, Mauriello joined the APC camera staff and has been a production cameraman at the Center for the past 17 years. During this time, he has photographed every conceivable type of picture.

On this occasion when I talked with him, he was working on a picture dealing with the classification and rehabilitation of military prisoners. He had just returned from a lengthy location trip to the Army Disciplinary Barracks, Fort Leavenworth, Kansas, and was in the process of doing the interiors on the main sound stage at APC. The set depicted a board room where prisoners are brought before a group of officers and civilian officials for classification.

"My problem on this picture is to match the studio interiors with the footage we got at Fort Leavenworth. So far I've had no special difficulties except that we worked in some pretty tight spots, like for example, prison cells while we were at the Disciplinary Barracks. Also, we used available light for some of the long shots. But we got beautiful results." He was using a Mitchell BNC camera mounted on a crab dolly and Worrall geared head. He told me he was using DuPont Superior 2 film and working at an average light level of about 150 foot candles. I learned from both Mauriello

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and Lipkowitz that this was about the average illumination volume employed on the stages at APC when monochrome films were used.

A few days later I watched Mauriello doing retakes for a film on radio communication. A Mitchell 16 camera mounted on a Raby dolly with Thomas geared head was trained on a soldier operating a radio from a jeep. The jeep stood in a wooded area which had been constructed in a corner of the main stage. The set was being lit with inkies to simulate outdoor daylight Mauriello told me he was working with Eastman Ektachrome Commercial film at an average light level of 100 foot candles and was matching scenes taken on location.

Mauriello has lost track of the total number of pictures he has photographed at APC. During the first nine months of 1962, he said he had photographed 17 films.

Motion picture camera equipment at the APC is standardized as much as possible, with emphasis on the various models of Mitchell cameras—BNC, NC, Standard and High Speed. If new equipment is offered to Lipkowitz for consideration, he usually asks two

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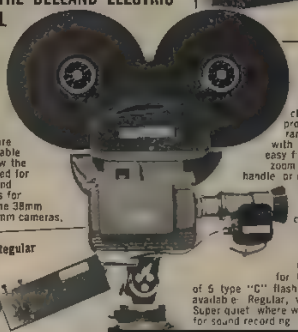

The cameraman can control the picture size by eye or can pre-set the zoom range by quick-set limit stops on the quadrant. A silicon loaded slip clutch and mechanical limit stops provide precise control of the zoom range. The control box is equipped with instant contact push-buttons for easy finger tip operation of zoom in or zoom out. The box mounts on a tripod handle or directly on the camera for hand held operation. It also may be held and operated by an assistant. Speed range is rheostat controlled and adjustable from approximately 2½ seconds to 10 seconds of zoom time. A special feature is the very efficient motor which operates for hundreds of moves on one set of 6 type "C" flashlight batteries. Two models are available: Regular, where noise is not a problem. Super quiet where whisper quiet operation is needed for sound recording.

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questions. "Will it do the job better than what is already available and will it reduce maintenance costs?" He also believes it highly desirable that equipment be sufficiently rugged for operation under unfavorable conditions in faraway locations such as Southeast Asia, Africa or the Arctic Circle.

Lipkowitz thinks that of all the places his crews have worked, none have presented greater problems to men and equipment than that of the Arctic Circle. Perhaps one of the finest examples of Arctic photography was that accomplished by Master Sergeant Lester A. Marks, who photographed "Operation Blue Jay," a documentary dealing with the testing of Army equipment in Greenland. Using an Eyemo camera, Marks worked under extremely difficult conditions in accompanying the expedition across the Polar ice cap. The resultant footage contained many remarkable scenes and breathtaking photography. This picture received a nomination by the Academy of Motion Picture Arts and Sciences in 1953 as the best short subject of the year.

Sergeant Alzen Floyd, who handled the cameras on "City Under Ice," a film also dealing with Army operations in Greenland, is another of the Center's cameramen who has successfully met the challenge of photography in the Arctic. Floyd used a Mitchell Standard camera and Eastman color film for this assignment. He protected his equipment by always avoiding sudden and excessive changes in temperature and of temperature differentials between equipment and film. Cameras and film were stored in an unheated room. When the camera had to be moved from a cold place to a warm room for interiors, the change was made slowly and by degrees. The camera was always carried into a room inside a rubberized, watertight bag, which was vapor-sealed. Excess air was pressed out of the bag before the camera was removed. Floyd never used a heated barney on the camera.

Normally a camera crew includes a first cameraman and two assistants. As a general rule, the first cameraman operates the camera. An exception is made in complicated sequences when an operator is assigned to a crew in order to free the first cameraman for overall supervision. The two assistants handle focus, magazines, reports, equipment and other related duties.

Each first cameraman is assigned his own outfit which includes a Mitchell Standard camera with all lenses and

accessories and a Bell & Howell Eyemo camera. Included in each outfit is a copy of the *American Cinematographer Manual* which APC camera men have found invaluable. Camera equipment, such as the Mitchell BNC, the Arriflex or Mitchell Sixteen, are assigned camera crews as they are needed.

A wide range of the latest type of studio lighting is available in abundance but some units are homemade such as the efficient banks of overhead flood units which have been built in the APC engineering shop. Portable lighting units, notably Colortan and Johnson lights, are used frequently for shooting on locations. Recently excellent results have been obtained with Sun-Gun units, which give the cameramen even greater portability. Many APC directors have expressed surprise at the excellent results various cameramen have been getting with the Sun-Guns. "It's hard for them to believe that such a little light can do such a good job," Lipkowitz told me.

Almost all Army films are photographed on 35mm film for standard screen projection, however, compositions are set up so that the picture can be effectively projected on wide screens or on television without image loss. Virtually all release prints are on 16mm, the format of most Army classroom projectors.

(To Be Continued)

REPORT FROM COLOGNE

Continued from Page 346

The handy method for carrying the camera is illustrated in Fig. 2, and the dual-spooled single-chamber film magazine is pictured in Fig. 3. The magazine includes the film movement and gate as an integral part - long a salient feature of Eclair portable 16mm cameras. The quick inter-change of motors is demonstrated in Fig. 4.

The American-made Auricon Pro-600 Special and Super-1200 16mm single system sound cameras were displayed in the booth of Hahnel-Kino-GmbH. Both cameras afford photography with sound on the same film strip. In addition to the standard optical sound recording facility, a magnetic recording head and transistorized amplifier and companion monitoring equipment is also available for both cameras where filming and recording

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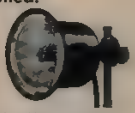

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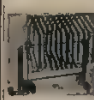

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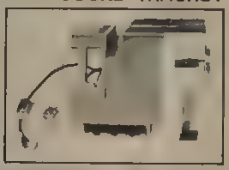

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are to be done on pre-striped single-perforated 16mm film.

Etablissments André Debrie displayed its latest professional 16mm camera, the Sinmor, designed for both newsreel and soundstage use. The Sinmor is an unusually lightweight unit, made so by the use of a tough and highly resilient plastic material for the housing, instead of metal. The camera takes external magazines, provides for a range of quick-interchange motors, and can be adapted for single-system sound and picture recording.

Among the accessory lenses for 16mm cameras displayed and worthy of mention here was the Vario-Sonnar f/2 designed for Arriflex 16mm cameras. A product of Carl Zeiss, lens has a zooming range between 12.5 and 75mm and incorporates a total of 15 lens elements grouped into 12 component groups. At the 12.5 setting it is a true wide-angle lens with an angle of view of 52°. At the long end setting it renders a telephoto angle of 9°.

Also shown was Zeiss' f 2 Distagon 8mm focal length lens, a super wide-angle lens for the 16mm format having a 75° angle of view. It is a well-corrected nine-element lens with high definition and excellent image illumination. ■

"JOURNEY TO THE STARS"

Continued from Page 345

edges. Its angular field of slightly more than 162 degrees assured sharp projection coverage of the vast hemispherical dome.

Because the ASA Type 1 film perforation is non-standard it was necessary to place special orders with Eastman Kodak Company for the 70mm film stocks required making the first time that Eastman Color negative, internegative and print stocks were manufactured in this size and perforation. In addition, three different black-and-white negatives were supplied: Tri-X, Plus-X and Background X.

Meanwhile, Fine Arts Productions, Inc., under the guidance of Producer-director John Wilson and Chief Cameraman Eugene Borghi, had begun filming the simulated voyage into 60 thousand billion miles of inter galactic space. The production called for incredible precision and the exploration of new frontiers in three-dimension stop-motion photography and animation.

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To simulate the black sky ablaze with stars that was to serve as the background for the entire film, a special 10-foot dome was constructed of fiberglass painted black on the inside and drilled with more than 1,000 individual holes accurately plotted to duplicate constellations covering 210 degrees of the Northern hemisphere. The holes, representing five magnitudes of star brightness, ranged in size from 1/8 to 1/64 inch in diameter. Outside and above the dome forty 10KW lamps produced an over-all even

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light that was given a measure of diffusion by a white silk parachute draped over the dome. The effect was to soften the light coming through the holes without eliminating the required star-like sparkle.

The camera was placed inside the dome, shooting straight up at the man-made heavens. Because of the need to minimize grain and insure maximum sharpness of the star images, this background scene was photographed on black-and-white Plus X film and printed on Eastman high contrast stock.

For part of the footage, large stars and galaxies such as the Milky Way were accurately reproduced in white paint on the inside surface of the dome. These paintings were illuminated by leak light spilling through fiberglass shields arranged around the bottom of the dome. Thus, the small stars were exposed by light reflected from the painted inner surface. By experimenting, exposure was balanced to photograph both in proper tonal ratio without graying the background.

Three-dimensional models of the planets, asteroids and the Moon were constructed in miniature and averaged three feet in diameter. Colors and topography were accurately reproduced according to latest scientific data. It required two months of steady work to faithfully duplicate the crater-pocked surface of the moon.) These models were lined up in proper relationship against a black draped stage on a 100-foot path along which the stop-motion camera dollied in steps of 1/4-inch per frame. Crews rotated each model by means of intricate gear-mechanisms as the director called out numbered directions for each exposure.

The huge inverted telephoto lens, with its 30 lbs. of glass elements, violated many of the established principles of optics and, in effect, made its own rules. Firstly, spherical aberration caused a fall-off of sharpness at the edges when the image was in sharp focus at the center of the composition, and vice versa. Through trial-and-error experiments, a midpoint of focus was located which indicated that the desired overall sharpness could be achieved in the photography by stopping down the lens aperture to f. 11. There was not enough light, however, to permit motion picture photography at this aperture at conventional camera speeds. The alternative was to shoot the sequence in stop-motion, a frame at a time, at exposures of 1/2-minute each -which is the procedure decided upon.

Secondly, the extreme wide-angle characteristic of the lens diminished images to such an extent that it was often necessary to move the camera within 2 or 3 inches of a 3-foot planet model in order to fill the frame with the subject. To get a realistic illusion of soaring past the Moon, the camera was dollied, between stop-motion exposures, to within 1/4-inch of the surface of the model. In the case of Saturn, the scene began with a conventional long shot of the ringed planet -then the camera approached and tilted 90 degrees, skimming along within 1/8 inch of the slowly revolving rings.

The lift-off from Earth which opens the picture might have been filmed with greater ease had a 10-foot globe been used with the camera mounted on a Chapman boom. Since elements of such size were not practical, the camera started at a point 1/8 of an inch from the surface of a 4-foot Earth model, skimmed along in simulated orbit and then lifted free of the planet the entire maneuver taking approximately 25 seconds on the screen.

A special cradle was built for the camera which incorporated two gear-heads, mounted one above the other. This permitted full 360-degree horizontal and 160-degree vertical rotation of the camera to simulate the view from the lookout port of a space ship. Each gear-head was precisely calibrated to insure the smoothest possible stop-motion photography.

As the camera approached within 18 inches of an object, focus became highly critical and had to be corrected every five or six frames. Precise control was made possible by a Vernier guage having micrometer calibrations down to 1 1000th of an inch. Checking focus through the lens was a complicated operation, there being no lateral rackover mechanism on the camera. In order to make a quick check of the framing only, the camera was racked back from the lens and a prism-type viewer inserted sideways at the film plane to show an inverted image of the scene. To check for critical focus, however, it was necessary to clear the film, disengage it from the movement, remove the movement from the camera and insert a special scope inside the camera body for critical viewing through the lens.

Phenomena such as the Beta Lyra star, with its spiral-shaped luminous trail, the Super Nova (an exploding star) and the Andromeda galaxy were created by means of multi-plane animation techniques using glass "cels" up to five feet square. The coloring for these heavenly objects was derived from authentic color photographs taken at Mt. Wilson Observatory. A dense celestial cloud of wispy gas called Lagoon Nebula was simulated by constructing a large wire tunnel, which was sprayed first with artificial cobwebs and then with prismatic colors of blue and red. It was built in breakaway sections so that the camera could move through it.

With filming now underway, facilities had to be adapted for processing and printing. Because of the non-standard characteristics of the raw stock it was necessary for Technicolor to modify its 70mm friction drive positive machine to negative processing. Lin Dunn, Don Weed and William Littschwager combined efforts to convert a Model J Bell & Howell continuous printer to 70mm for the printing of dailies and release prints. Special film-handling equipment, such as gang synchronizers, splicers, etc., was built by Benson Lehner.

It developed that optical printing would be necessary to superimpose the main images of the planets over the star backgrounds and to create other special effects. For this Film Effects of Hollywood designed and built a special optical printer. This incorporated a second Benson Lehner camera set-up for bi-packing and a newly-built projection head.

So that experimentation in the projection phase might continue during production, the complete dome and projection system were set up on Stage 10 of Hal Roach Studios, in Culver City, Calif., this being the only available building in Los Angeles having sufficient ceiling clearance to accomodate the installation. Two months before opening of the Fair the dome and equipment were dismantled and shipped to Seattle for installation. A sound system was incorporated, consisting of a four-track Ampex 35mm tape transport synchronized to the two projectors with a switching circuit to tie in to the particular projector in operation.

The dome was suspended from the ceiling within the square building so that the axis had a 10-degree incline normal to the 10-degree slope of the tiered audience area within the auditorium. It was intended that the audience should stand during the showing, for which hand-rails were provided. The projection booth was elliptical in shape and centered to the dome. The projection lens extended from the booth at a height to provide a clear throw to the screen. Cinerama operated the exhibit during the entire run of the Fair using a crew of six projectionists in three shifts, and giving 33 continuous performances a day for 184 days without any down-time due to equipment malfunctions. Twenty release prints were used in over 6,000 performances for an average of 261 performances per print.

Meanwhile, "Journey to the Stars" continues to thrill visitors to Seattle's Spacearium, which is now part of a permanent science exhibit established after close of the 1962 Fair. Reduced to 35mm format and projected on a 30-foot dome, the film recently played to more than 40,000 people at a space show presented by the Lytton Center of Visual Arts in Hollywood. It will also be a special attraction at the forthcoming Los Angeles Home Show. ■

ROLL CUE!

Continued from Page 342

verbal directions are done in a falsetto voice to distinguish them from the recorded cue text.

The scenes are now ready to be shot. The tape is rewound to a predetermined start and, after the sync recorder has attained speed, the cameras are rolling, and everything is properly slated, the director gives the command, "Roll cue!" At this point, the recorder begins to play back the pre-recorded text of the script, feeding it to the talent by means of a concealed hearing aid earphone, thus providing aural prompting or cueing and making unnecessary the conventional "idiot cards" or mechanical prompting device for this purpose.

With a minimum of practice, the talent can follow the cue playback and stay about a half-sentence behind it in his delivery. Moreover, he can maintain better "eye contact" with the camera lens, his overall performance is improved, and retakes are cut to a minimum.

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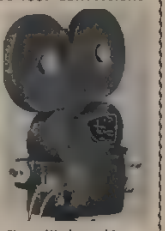
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system has varied. Some have found it more difficult to become accustomed to than others. None have required more than an hour or two, however, to get used to sound coming into the ear and talking at the same time. It is a little frightening on the very first test, but within a few minutes things settle down, and soon the talent finds that he can do it.

With professional talent, the system seems simple. Bob Earl, Master of Ceremonies of the CBS show, "The General Electric College Bowl," can report for a shooting session on our stage at ten o'clock, be handed a script he has never seen, go through one walk through and make a recording. Then, after one take with the cameras rolling, he is finished. For Bob, we could paint on the slate a permanent "Take One."

Bob, of course, is an old hand at this type of cueing. On television he would do a complete newscast, never looking at the script, but turning the pages as he heard a tongue click from playback of a tape that he had recorded earlier.

In cases where we are dealing with non-professional actors, we have found that our most successful use of the system comes from introducing the talent to the system during the early stages of script preparation. At Cornell, many subject matter specialists are also the talent. By showing them early how the system works and how they should stay a half sentence behind the script, they can start practicing at home or in the office, using a dictating machine or personal tape recorder. A little practice at home or in the quietness of the office does wonders to further enhance the final filming.

There are a few things we have learned in setting up the cue system. One important point is to have the earphone concealed on the back of the talent instead of in his ear. A thin plastic tube is then attached between the earphone and the earmould in the ear. The hollow tube and earmould are much smaller and easier to hide than any earphone inserted in the ear. All the earphones we have tested so far which attach directly to the ear have been visible to the cameras. The use of a hearing aid earmould with the sound piped to it from an earphone through a short length of plastic tubing solves the problem.

In running several tests, we have found that the plastic tubing can be as long as three feet. We have made tests with the tubing as long as ten feet but we found we were pushing the volume and had some leakage into the mike.

Earmoulds can be purchased in many sizes and we have an assortment ready for any talent. They also are made for both left and right ears. Incidentally, we have found that a little make-up applied to the plastic tube helps to camouflage and make it invisible to the camera lens. ■

HITCH-HIKE SYNC

Continued from Page 341

fed into track No. 2 of the ¼-inch tape recorder, once again effectively hitch-hiking the sync and maintaining frame-for-cycle reference even though wild motors are used. The actor merely fits his lines to the lip movements on the screen and records them on track No. 1 of the tape.

Narration is simple with the same system: here you keep the film intact, stripe the print, hitch-hike the sync to ¼-inch track No. 2 while recording narration on track No. 1. Once an acceptable narration or dialogue track has been cut, music can be added by using a set-up similar to that shown in Fig. 2 (not cutting loops, of course), and mixing the score from another source (live or recorded) with the narration from recorder No. 1 track No. 1 to recorder No. 2 track No. 1 while hitch-hiking the sync from recorder No. 1 track No. 2 to recorder No. 2 track No. 2. When transferred and printed the picture and sound will synchronize perfectly.

If it is necessary or desirable to prerecord a musical selection with the talent on-camera pantomiming to a playback, the sync generator is used again. The procedure is to record the selection on recorder No. 1 track No. 1, then, while playing it back through a speaker, simultaneously shoot the pantomime picture with the synchronous drive camera and feed the output of the sync generator onto track No. 2.

Just a word of caution: contact your lab regarding your plans before embarking on any extensive recording and dubbing sessions as outlined here. The lab may wish certain test levels on the tape as a guide to adjusting their transfer equipment. ■

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16MM PRINTING LEADERS

Continued from Page 347

phone call. When he came back, later, he didn't think he'd advanced the track, so he advanced it another 26 frames—and again was called away before labeling it. But, this time, as he left, he told one of his men to "mark the printing sync"—which the man understood to mean advance-and-label. So, the track was advanced another 26 frames. When the print was made it had one of the longest sound introductions on record and was way out of sync.

The other part of the problem has to do with terminology.

Edit Sync, Dead Sync, Straight Across Sync, etc. all seem to mean the same thing—the sound edited in a synchronizer to exactly and properly match the picture rolls.

Similarly, Printer Sync, Printing Sync, Projection Sync, Married Sync all mean that this sync mark indicates the sound track has been advanced 26 frames, ready for printing.

Now, most all laboratories will accept 16mm films edited and marked in any manner the producer prefers and will do their best to understand, and fill the order correctly.

But, in the interest of clarity and to make life easier for all concerned, it is recommended that you use these:

1. *Edit Sync* for the straight-across photo-and-sound roll match in the synchronizer.

2. *Print* (or *Printing*) *Sync* for the 26 frame advance for printing, marked on the sound roll leader only.

3. If there's any question at all, mark *Edit Sync* only—On *both* the picture and sound rolls—and let the laboratory advance the track and mark it for printing sync.

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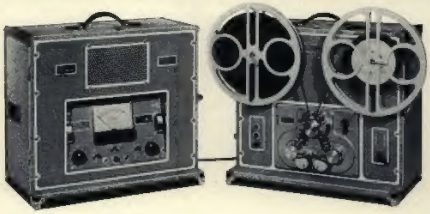

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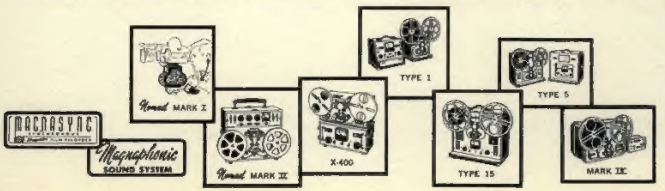

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Century Camera Shops, Inc.
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S.O.S. Photo-Cine-Optics, Inc.
602 W. 52nd, PL 7-0440
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Wilson Camera Sales Co.
130 W. Adams, AL 4-0662
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Stanley Photo Service
106 N. Broadway, CE 1-7840
SAN FRANCISCO, CALIF.
Brooks Cameras, Inc.
45 Kearny, EX 2-1902
SAN MATEO, CALIF.
Foreman's
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Photo Agencies Pty. Ltd.
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Sixteen Millimetre
Australia Pty. Ltd.
49 Market, New South Wales
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Kinovox Electric Corp.
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ENGLAND, London
Delane Lea Processes, Ltd.
12 Moor St., (W-1)
Gordon Cameras, Ltd.
45 Kensington High, (W-8)
FRANCE, Paris
Brockliss-Simplex S.A.
6, Rue Guillaume Tell
GERMANY, Hilden Dusseldorf
Gerhard Johansen
3 Lessingstrasse
GREECE, Athens
Christos Axaris
50 Stadium St.
HONG KONG
Supreme Trading Co.
60 Hennessy Road
INDIA, Bombay
Kine Engineers
26, New Queen's Road
ITALY, Rome
Reportfilm, di J.M. Schuller
Via Antonio Bertolini 31
JAPAN, Tokyo
J. Osawa & Co., Ltd.
5, Ginza, Nishi 2-Chrome, Chuo-ku
NEW ZEALAND, Auckland
Kerridge Odeon Industries
St. James Building, Queen St.
PAKISTAN, Karachi-3
Film Factors, Ltd.
27 Victoria Rd., Rex Annexe
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COLOR:
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Spray Picture Negative, 16 & 35mm
Spray Sound Negative, 16 & 35mm
Newsreel Negative, 16mm
Spray Picture Positive, 16 & 35mm
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Reversal, 16mm

Printing

COLOR:
Kodachrome, 16mm
Ansco, 16mm
EK Internegative, 16mm
EK Positive, 16mm
Reduction, 16mm
Blow-ups, 35mm
Optical, 16mm
Workprint, 16mm
Masters, 16mm
Answer Prints, 16mm
Release Prints, 16mm

BLACK AND WHITE:
Dupe Negative, 16 & 35mm
Master Positive, 16 & 35mm
Reversal, 16mm
Reduction, 16mm
Blow-ups, 35mm
Optical, 16mm
Track Prints, 16 & 35mm
Work Prints, 16 & 35mm
Answer Prints, 16 & 35mm
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